Complete Hardware Guide for EX3200 and EX4200 Ethernet Switches

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How to Use This Guide

Complete documentation for the EX Series product family is provided on webpages at http://www.juniper.net/techpubs/en_US/release-independent/information-products/pathway-pages/ex-series/product/index.html. We have selected content from these webpages and created a number of EX Series guides that collect related topics into a book-like format so that the information is easy to print and easy to download to your local computer.

This guide, *Complete Hardware Guide for EX3200 and EX4200 Switches*, collects together information about the EX3200 fixed-configuration and EX4200 virtual-chassis switches. The release notes are at http://www.juniper.net/techpubs/en_US/junos10.3/information-products/topic-collections/release-notes/10.3/junos-release-notes-10.3.pdf.

List of EX Series Guides for Junos OS Release 10.3

Title	Description
Complete Hardware Guide for EX2200 Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX2200 switches
Complete Hardware Guide for EX3200 and EX4200 Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX3200 and EX4200 switches
Complete Hardware Guide for EX4500 Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX4500 switches

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Title	Description
Complete Hardware Guide for EX8208 Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX8208 switches
Complete Hardware Guide for EX8216 Switches	Component descriptions, site preparation, installation, replacement, and safety and compliance information for EX8216 switches
Complete Software Guide for Junos® OS for EX Series Switches, Release 10.3	Software feature descriptions, configuration examples, and tasks for Junos OS for EX Series switches
Software Topic Collections	Software feature descriptions, configuration examples and tasks, and reference pages for configuration statements and operational commands (This information also appears in the *Complete Software Guide for Junos® OS for EX Series Switches, Release 10.3*.)
JUNOS® OS for EX Series Switches, Release 10.3: Access Control	
JUNOS® OS for EX Series Switches, Release 10.3: Configuration Management	
JUNOS® OS for EX Series Switches, Release 10.3: Class of Service	
JUNOS® OS for EX Series Switches, Release 10.3: Device Security	
JUNOS® OS for EX Series Switches, Release 10.3: Ethernet Switching	
JUNOS® OS for EX Series Switches, Release 10.3: Interfaces	
JUNOS® OS for EX Series Switches, Release 10.3: Layer 3 Protocols	
JUNOS® OS for EX Series Switches, Release 10.3: MPLS	
JUNOS® OS for EX Series Switches, Release 10.3: Multicast	
JUNOS® OS for EX Series Switches, Release 10.3: Network Management and Monitoring	
JUNOS® OS for EX Series Switches, Release 10.3: Port Security	
JUNOS® OS for EX Series Switches, Release 10.3: Power Management	
JUNOS® OS for EX Series Switches, Release 10.3: Routing Policy and Packet Filtering	
JUNOS® OS for EX Series Switches, Release 10.3: Software Installation	

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Title	Description
JUNOS® OS for EX Series Switches, Release 10.3: Spanning-Tree Protocols	
JUNOS® OS for EX Series Switches, Release 10.3: System Monitoring	
JUNOS® OS for EX Series Switches, Release 10.3: System Services	
JUNOS® OS for EX Series Switches, Release 10.3: System Setup	
JUNOS® OS for EX Series Switches, Release 10.3: User and Access Management	
JUNOS® OS for EX Series Switches, Release 10.3: User Interfaces	
JUNOS® OS for EX Series Switches, Release 10.3: Virtual Chassis	

Downloading Software

You can download Junos OS for EX Series switches from the Download Software area at http://www.juniper.net/customers/support/ . To download the software, you must have a Juniper Networks user account. For information about obtaining an account, see http://www.juniper.net/entitlement/setupAccountInfo.do.

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Documentation Symbols Key

Notice Icons		
Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Text and Syntax Conventions		
Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the **configure** command: user@host> **configure**
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host> show chassis alarms` `No alarms currently active`
Italic text like this	• Introduces important new terms. • Identifies book names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos System Basics Configuration Guide* • RFC 1997, *BGP Communities Attribute*
Italic text like this	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# **set system domain-name** *domain-name*
Plain text like this	Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on routing platform components.	• To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Enclose optional keywords or variables.	**stub <default-metric** ***metric*****>;**

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Text and Syntax Conventions		
Convention	Description	Examples
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** (***string1*** **|** ***string2*** **|** ***string3***)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	**rsvp { # Required for dynamic MPLS only**
[ ] (square brackets)	Enclose a variable for which you can substitute one or more values.	**community name members [** ***community-ids*** **]**

Indention and braces ({ })	Identify a level in the configuration hierarchy.	[edit]
		routing-options {
		  static {
		  route default {
		  nexthop *address*;
		  retain;
		  }
		  }
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. Send e-mail to techpubs-comments@juniper.net with the following:

- Document URL or title
- Page number if applicable
- Software version
- Your name and company

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Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf .
- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/ .
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: http://www.juniper.net/customers/support/
- Search for known bugs: http://www2.juniper.net/kb/
- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/
- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: https://www.juniper.net/alerts/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://tools.juniper.net/SerialNumberEntitlementSearch/

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at http://www.juniper.net/cm/ .
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see http://www.juniper.net/support/requesting-support.html .

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PART 1

Switch and Components Overview and Specifications

- EX3200 and EX4200 Switches Overview on page 3
- Component Descriptions on page 13
- Component Specifications on page 39

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CHAPTER 1

EX3200 and EX4200 Switches Overview

- EX3200 and EX4200 Switches Hardware Overview on page 3
- EX3200 Switch Models on page 6
- EX4200 Switch Models on page 6
- Chassis Physical Specifications for EX3200 and EX4200 Switches on page 7
- Front Panel of an EX3200 Switch on page 7
- Rear Panel of an EX3200 Switch on page 8
- Front Panel of an EX4200 Switch on page 9
- Rear Panel of an EX4200 Switch on page 11

EX3200 and EX4200 Switches Hardware Overview

Juniper Networks EX Series Ethernet Switches provide scalable connectivity for the enterprise market, including branch offices, campus locations, and data centers. The switches run under the Juniper Networks Junos operating system (Junos OS), which provides Layer 2 and Layer 3 switching, routing, and security services. The same Junos OS code base that runs on EX Series switches also runs on all Juniper Networks J Series, M Series, MX Series, and T Series routers.

- EX3200 and EX4200 Switch Types on page 3
- EX3200 Switches on page 4
- EX4200 Switches on page 4
- Uplink Modules on page 5
- Power over Ethernet (PoE) Ports on page 5

EX3200 and EX4200 Switch Types

Juniper Networks EX3200 and EX4200 Ethernet Switches are two closely related product lines:

- **EX3200 switches**—Typically, you deploy these switches in branch environments or wiring closets.
- **EX4200 switches**—You can interconnect EX4200 switches to form a Virtual Chassis that operates as a single network entity. You can deploy these switches wherever you need a high density of Gigabit Ethernet ports (24 to 480 ports), redundancy, or the

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ability to span a single switch across several wiring closets. Typically, EX4200 switches are used in large branch offices, campus wiring closets, and top-of-rack locations in a data center.

Both lines have these features:

- Run under Junos OS for EX Series switches
- Have options of 24-port and 48-port models
- Have options of full (all ports) or partial (8 ports) Power over Ethernet (PoE) capability
- Have optional uplink modules that provide connection to distribution switches

EX3200 Switches

EX3200 switches provide connectivity for low-density environments. Typically, you deploy these switches in branch environments or wiring closets where only one switch is required.

EX3200 switches are available in models with either 24 or 48 ports and with either all ports equipped for Power over Ethernet (PoE) or only 8 ports equipped for PoE. All models provide ports that have 10/100/1000Base-T Gigabit Ethernet connectors and optional 1-gigabit small form-factor pluggable (SFP) transceivers, 10-gigabit small form-factor pluggable (SFP+) transceivers, or 10-gigabit small form-factor pluggable (XFP) transceivers for use with fiber connections.

EX3200 switches include:

- A field-replaceable power supply and an optional additional connection to an external power source.
- A field-replaceable fan tray with single fan.
- Junos OS with its modular design that enables failed system processes to gracefully restart.

EX4200 Switches

EX4200 switches provide connectivity for medium- and high-density environments and scalability for growing networks. These switches can be deployed wherever you need a high density of Gigabit Ethernet ports (24 to 480 ports) or redundancy. Typically, EX4200 switches are used in large branch offices, campus wiring closets, and data centers where they can be positioned as the top device in a rack to provide connectivity for all the devices in the rack.

You can connect individual EX4200 switches together to form one unit and manage the unit as a single chassis, called a *Virtual Chassis*. You can add more member switches to the Virtual Chassis as needed, up to a total of 10 members.

EX4200 switches are available in models with 24 or 48 ports and with either all ports equipped for Power over Ethernet (PoE) or only 8 ports equipped for PoE. All models provide ports that have 10/100/1000Base-T Gigabit Ethernet connectors and optional 1-gigabit small form-factor pluggable (SFP) transceivers, 10-gigabit small form-factor

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pluggable (SFP+) transceivers, or 10-gigabit small form-factor pluggable (XFP) transceivers for use with fiber connections.

Additionally, a 24-port model provides 100Base-FX/1000Base-X SFP ports. This model is typically used as a small distribution switch.

All EX4200 switches have dedicated 64-Gbps Virtual Chassis ports that allow you to connect the switches to each other. You can also use optional uplink module ports to connect members of a Virtual Chassis across multiple wiring closets.

To provide carrier-class reliability, EX4200 switches include:

- Dual redundant power supplies that are field-replaceable and hot-swappable. An optional additional connection to an external power source is also available.
- A field-replaceable fan tray with three fans. The switch remains operational if a single fan fails.
- Redundant Routing Engines in a Virtual Chassis configuration. This redundancy enables GRES (graceful Routing Engine switchover) and nonstop active routing.
- Junos OS with its modular design that enables failed system processes to gracefully restart.

Uplink Modules

Optional uplink modules are available for all EX3200 and EX4200 switches. Uplink modules provide two 10-gigabit small form-factor pluggable (XFP) transceivers, four 1-gigabit small form-factor pluggable (SFP) transceivers, or two 10-gigabit small form-factor pluggable (SFP+) transceivers. You can use XFP, SFP, or SFP+ ports to connect an access switch to a distribution switch or to interconnect member switches of a Virtual Chassis across multiple wiring closets.

Power over Ethernet (PoE) Ports

PoE ports provide electrical current to devices through the network cables so that separate power cords for devices such as IP phones, wireless access points, and security cameras are unnecessary. Both the EX3200 and EX4200 switches have options of full (all 24 or 48 ports) or partial (8 ports) PoE capability.

Full PoE models are primarily used in IP telephony environments. Partial PoE models are used in environments where, for example, only a few ports for wireless access points or security cameras are required.

Related Topics

- EX3200 Switch Models on page 6
- EX4200 Switch Models on page 6
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Site Preparation Checklist for EX3200 and EX4200 Switches on page 87

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EX3200 Switch Models

The EX3200 switch is available with 24 or 48 ports with partial or full Power over Ethernet (PoE) capability. Table 1 on page 6 lists the EX3200 switch models.

Table 1: EX3200 Switch Models

Model	Typical Deployment	Access Ports	Number of PoE-enabled Ports	Power Supply (Minimum)
EX3200-24T	Access or Distribution switch	24 Gigabit Ethernet	First 8 ports	320 W
EX3200-24P	Access switch	24 Gigabit Ethernet	All 24 ports	600 W
EX3200-48T	Access or Distribution switch	48 Gigabit Ethernet	First 8 ports	320 W
EX3200-48P	Access switch	48 Gigabit Ethernet	All 48 ports	930 W

Related Topics

- EX4200 Switch Models on page 6
- Front Panel of an EX3200 Switch on page 7
- Rear Panel of an EX3200 Switch on page 8
- EX3200 and EX4200 Switches Hardware Overview on page 3

EX4200 Switch Models

The EX4200 switch is available with 24 or 48 ports and with partial or full Power over Ethernet (PoE) capability. Table 2 on page 6 lists the EX4200 switch models.

Table 2: EX4200 Switch Models

Model	Ports	Number of PoE-enabled Ports	Power Supply (Minimum)
EX4200-24T	24 Gigabit Ethernet	First 8 ports	320 W
EX4200-24P	24 Gigabit Ethernet	All 24 ports	600 W
EX4200-48T	48 Gigabit Ethernet	First 8 ports	320 W
EX4200-48P	48 Gigabit Ethernet	All 48 ports	930 W
EX4200-24F	24 small form-factor pluggable (SFP) transceivers	Not applicable	320 W

Related Topics

- EX3200 Switch Models on page 6
- Front Panel of an EX4200 Switch on page 9

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- Rear Panel of an EX4200 Switch on page 11
- EX3200 and EX4200 Switches Hardware Overview on page 3

Chassis Physical Specifications for EX3200 and EX4200 Switches

The EX3200 and EX4200 switch chassis is a rigid sheet-metal structure that houses the hardware components. Table 3 on page 7 summarizes the physical specifications of the EX3200 and EX4200 switch chassis.

Table 3: Physical Specifications of the EX3200 and EX4200 Switch Chassis

Description	Value
Chassis height	1.75 in. (4.45 cm)
Chassis width	• 17.25 in. (43.82 cm) • 19 in. (48.2 cm) with mounting brackets attached

Chassis depth	• Without power supply installed—17 in. (43.18 cm)
	• With power supply installed:
	  ◦ 320 W AC power supply or 190 W DC power supply installed—17 in. (43.18 cm)
	  ◦ 600 W or 930 W AC power supply installed—19.25 in. (48.9 cm)

Weight	• EX3200 switch with 1 power supply: 15–17 lb (6.8–7.7 kg) • EX4200 switch with 1 power supply: 16–18 lb (7.2–8.2 kg) • 320 W AC power supply: 2.5 lb (1.1 kg) • 600 W and 930 W AC power supplies: 3.1 lb (1.4 kg) • 190 W DC power supply: 2.5 lb (1.1 kg)

Related Topics

- Rack Requirements for EX3200 and EX4200 Switches on page 93
- Cabinet Requirements for EX3200 and EX4200 Switches on page 94
- Mounting an EX3200 or EX4200 Switch on page 120
- Installing and Connecting an EX3200 or EX4200 Switch on page 117
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131

Front Panel of an EX3200 Switch

The front panel of an EX3200 switch consists of the following components:

- 10/100/1000Base-T Gigabit Ethernet ports, some or all of which are enabled for Power over Ethernet (PoE)
- Uplink module ports—SFP, SFP+, or XFP ports (The uplink module is an optional feature.)

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- LCD panel and the LCD navigation buttons
- Chassis status LEDs
- Network port LEDs

Figure 1 on page 8 shows the front panel of an EX3200 switch with 48 Gigabit Ethernet ports. Figure 2 on page 8 shows the front panel of an EX3200 switch with 24 Gigabit Ethernet ports. Models are available that have either all ports equipped for Power over Ethernet (PoE) or only 8 ports equipped for PoE. All ports have 10/100/1000Base-T Gigabit Ethernet connectors.

Figure 1: EX3200 Switch with 48 Gigabit Ethernet Ports

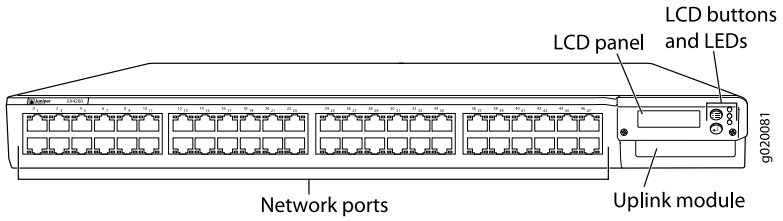
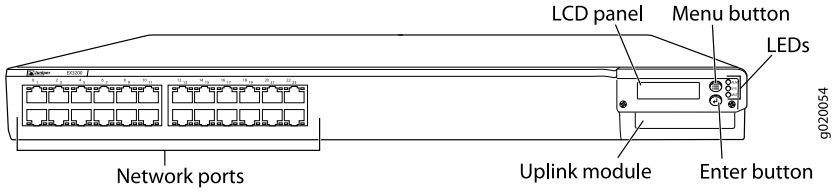


Figure 2: EX3200 Switch with 24 Gigabit Ethernet Ports



Related Topics

- Chassis Status LEDs in EX3200 Switches on page 19
- Rear Panel of an EX3200 Switch on page 8
- Network Port LEDs in EX3200 and EX4200 Switches on page 21
- Network Port Connector Pinout Information for an EX3200 or EX4200 Switch on page 40
- LCD Panel in EX3200 and EX4200 Switches on page 13
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Installing an Uplink Module in an EX3200 or EX4200 Switch on page 135
- Removing an Uplink Module from an EX3200 or EX4200 Switch on page 177

Rear Panel of an EX3200 Switch

The rear panel of the EX3200 switch consists of the following components:

- Protective earthing terminal
- Temperature shutdown LED

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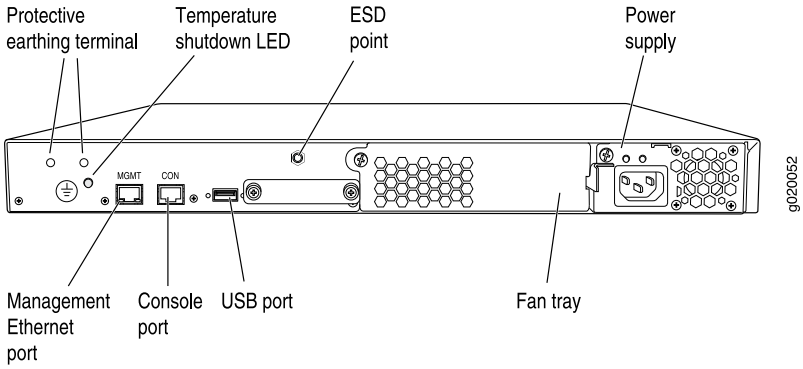
- Management Ethernet port
- Console port
- USB port
- ESD point
- Fan tray
- Power supply

Figure 3 on page 9 shows the rear panel of an EX3200 switch with a 320 W power supply. All EX3200 switches have the same rear panel. The 320 W AC power supply and the 190 W DC power supply are flush with the chassis. The 600 W AC power supply and 930 W AC power supply extend out of the chassis by 2.25 in. The power cord retainer clips extend out of the power supply by 3 in.

Figure 3: EX3200 Switch Rear Panel



Related Topics

- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Front Panel of an EX3200 Switch on page 7
- USB Port Specifications for an EX Series Switch on page 39
- Cooling System and Airflow in an EX3200 Switch on page 31
- Power Supply in EX3200 and EX4200 Switches on page 27
- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236
- Connecting Earth Ground to an EX Series Switch on page 141
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131

Front Panel of an EX4200 Switch

The front panel of an EX4200 switch consists of the following components:

- Network ports—depending on the switch model, either of:

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  - 10/100/1000Base-T Gigabit Ethernet ports, some or all of which are enabled for Power over Ethernet (PoE)
  - 100Base-FX/1000Base-X SFP ports for use with fiber-optic connections
- Uplink module ports—SFP, SFP+, or XFP ports (The uplink module is an optional feature.)
- LCD panel and the LCD navigation buttons
- Chassis status LEDs
- Network port LEDs

Figure 4 on page 10 shows the front panel of an EX4200 switch with 48 Gigabit Ethernet ports. Figure 5 on page 10 shows the front panel of an EX4200 switch with 24 Gigabit Ethernet ports. Figure 6 on page 10 shows the front panel of an EX4200-24F switch with 24 SFP ports for use with fiber-optic connectors.

Figure 4: EX4200 Switch with 48 Gigabit Ethernet Ports

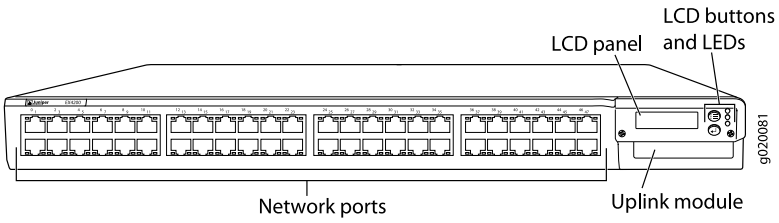


Figure 5: EX4200 Switch with 24 Gigabit Ethernet Ports

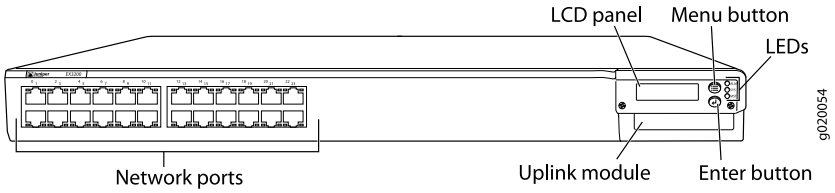
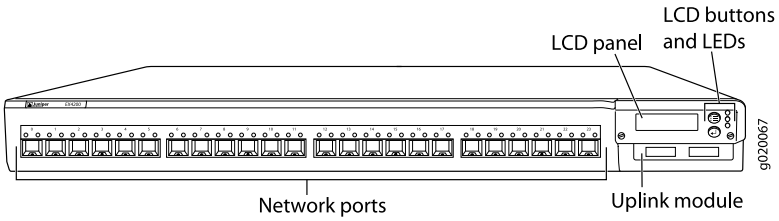


Figure 6: EX4200-24F Switch with 24 SFP Ports



Related Topics

- Chassis Status LEDs in EX4200 Switches on page 20
- Rear Panel of an EX4200 Switch on page 11
- Network Port LEDs in EX3200 and EX4200 Switches on page 21
- Network Port Connector Pinout Information for an EX3200 or EX4200 Switch on page 40
- LCD Panel in EX3200 and EX4200 Switches on page 13

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- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Installing an Uplink Module in an EX3200 or EX4200 Switch on page 135
- Removing an Uplink Module from an EX3200 or EX4200 Switch on page 177

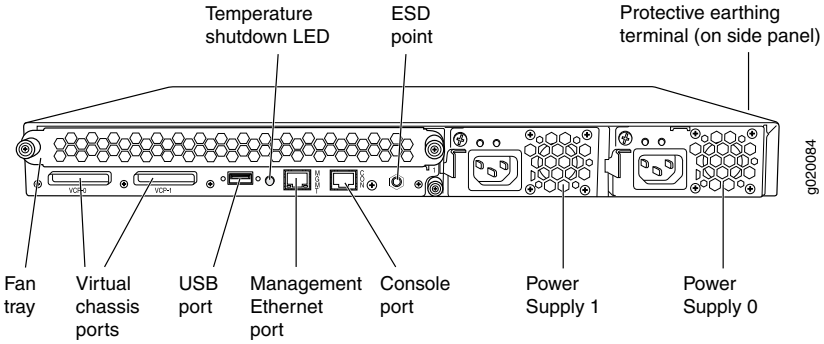
Rear Panel of an EX4200 Switch

The rear panel of the EX4200 switch consists of the following components:

- Fan tray
- Virtual Chassis ports (VCPs)
- USB port
- Temperature shutdown LED
- Management Ethernet port
- Console port
- ESD point
- Power supply or power supplies

Figure 7 on page 11 shows the rear panel of an EX4200 switch. All EX4200 switches have the same rear panel. The 320 W AC power supply and the 190 W DC are flush with the chassis. The 600 W AC power supply and 930 W AC power supply extend out of the chassis by 2.25 in. Power cord retainer clips extend out of the power supply by 3 in.

Figure 7: EX4200 Switch Rear Panel



Related Topics

- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Front Panel of an EX4200 Switch on page 9
- USB Port Specifications for an EX Series Switch on page 39
- Cooling System and Airflow in an EX4200 Switch on page 33
- Power Supply in EX3200 and EX4200 Switches on page 27

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- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236
- Connecting Earth Ground to an EX Series Switch on page 141
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch on page 105

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CHAPTER 2

Component Descriptions

- LCD Panel in EX3200 and EX4200 Switches on page 13
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Chassis Status LEDs in EX3200 Switches on page 19
- Chassis Status LEDs in EX4200 Switches on page 20
- Network Port LEDs in EX3200 and EX4200 Switches on page 21
- Management Port LEDs in EX3200 and EX4200 Switches on page 25
- Power Supply in EX3200 and EX4200 Switches on page 27
- AC Power Supply LEDs in EX3200 and EX4200 Switches on page 30
- DC Power Supply LEDs in EX3200 and EX4200 Switches on page 30
- Cooling System and Airflow in an EX3200 Switch on page 31
- Cooling System and Airflow in an EX4200 Switch on page 33
- Uplink Modules in EX3200 and EX4200 Switches on page 34

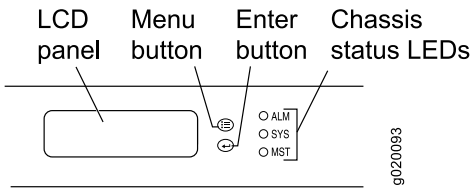
LCD Panel in EX3200 and EX4200 Switches

The LCD panel on the front panel of EX3200 and EX4200 switches shows two lines of text, each a maximum of 16 characters in length. The LCD panel displays a variety of information about the switch and also provides a menu to perform basic operations such as initial setup and reboot.

There are two navigation buttons—**Menu** and **Enter**—to the right of the LCD panel.

See Figure 8 on page 13.

Figure 8: LCD Panel in EX3200 and EX4200 Switches



You can configure the second line of the LCD panel to display a custom message. If the LCD panel is configured to display a custom message, the **Menu** button and the **Enter** button are disabled. See Configuring the LCD Panel on EX Series Switches (CLI Procedure).

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The LCD panel has a backlight. If the LCD panel is idle for 60 seconds, the backlight turns off. You can turn on the backlight by pressing the **Menu** or **Enter** button once. After turning on the backlight, you can toggle between the LCD panel menus by pressing the **Menu** button and navigate through the menu options by pressing the **Enter** button.

NOTE: The chassis viewer in the J-Web interface also displays the LCD panel. From the J-Web interface, you can view real-time status information in the LCD panel. See Dashboard for EX Series Switches.

This topic describes:

- LCD Panel Modes on page 14
- LCD Panel Menus on page 15

LCD Panel Modes

The LCD panel operates in four modes: boot, idle, status, and maintenance.

The LCD panel operates in boot mode during switch reboot. The boot mode displays the key milestones in the switch boot process. The boot mode does not have any menu options. After the boot process is complete, the LCD panel automatically reverts to the Idle menu.

In an EX3200 switch, the first line of the LCD panel displays the hostname.

In an EX4200 switch that is not a member of a Virtual Chassis, the first line of the LCD panel displays the slot number, the role of the switch, and hostname. For a standalone EX4200 switch, the slot number is always **00** and the role is always **RE** (for master).

In an EX4200 switch that is a member of a Virtual Chassis, the first line of the LCD panel displays:

- The slot number (the member ID for the Virtual Chassis member)
- Role of the switch in a Virtual Chassis (**RE** for master, **BK** for backup, and **LC** for linecard member)
- Hostname

In the idle mode, the second line displays the mode of the network ports' Status LED and the number of chassis alarms. The number of alarms is updated every second.

In the status mode, the second line displays:

- Virtual Chassis port (VCP) status (for an EX4200 switch that is a member of a Virtual Chassis)
- Status of the power supply
- Status of the fan and temperature
- Version of Junos OS for EX Series switches loaded on the switch

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In the maintenance mode, the second line displays one of the following options that you can use to configure and troubleshoot the switch:

- System halt
- System reboot
- Load rescue
- Request VC port (for an EX4200 switch that is a member of a Virtual Chassis)
- Factory default
- System EZSetup

LCD Panel Menus

The LCD panel has three menus: Idle, Status, and Maintenance. Toggle between the LCD panel menus by pressing the **Menu** button. Navigate through the menu options by pressing the **Enter** button.

Table 4 on page 15 describes the LCD panel menu options.

Table 4: LCD Panel Menu Options in EX3200 and EX4200 Switches

Menu	Description

IDLE	In the Idle menu:
	• Press **Enter** to cycle through the Status LED modes:
	  ◦ ADM (administrative status)
	  ◦ DPX (duplex)
	  ◦ Power over Ethernet (PoE)
	  ◦ SPD (speed)
	  See "Network Port LEDs in EX3200 and EX4200 Switches" on page 21 for information on the Status LED modes.
	• Press **Menu** to exit the Idle menu and go to the Status menu.

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Table 4: LCD Panel Menu Options in EX3200 and EX4200 Switches *(continued)*

Menu	Description

STATUS	The Status menu has the following options:
	• Show VCP status—Choose one of the following:
	  ◦ Press the **Enter** button to display the Virtual Chassis port (VCP) status: Up, Down, Disabled. This menu option is available only for an EX4200 switch that is a member of a Virtual Chassis configuration.
	  ◦ Press the **Menu** button to go to the next option in the Status menu.
	• Show PSU status—Choose one of the following:
	  ◦ Press the **Enter** button to display the status of the power supply: OK, Failed, Absent.
	  ◦ Press the **Menu** button to go to the next option in the Status menu.
	• Show Environment status—Choose one of the following:
	  ◦ Press the **Enter** button to display the status of the fan and temperature:
	  ▪ Fan status: OK, Failed, Absent
	  ▪ Temp status: OK, High, Shutdown
	  ◦ Press the **Menu** button to go to the next option in the Status menu.
	• Show Junos version—Choose one of the following:
	  ◦ Press the **Enter** button to version of Junos OS for EX Series switches loaded on the switch.
	  ◦ Press the **Menu** button to go to the next option in the Status menu.
	• EXIT STAT MENU?—Choose one of the following:
	  ◦ Press the **Enter** button to exit the Status menu. Then press the **Menu** button to go to the Maintenance menu.
	  ◦ Press the **Menu** button to return to the Show VCP status option.
	If you do not want users to use Status menu options, disable the entire menu or individual menu options. See Configuring the LCD Panel on EX Series Switches (CLI Procedure).

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Table 4: LCD Panel Menu Options in EX3200 and EX4200 Switches *(continued)*

Menu	Description
MAINT (Maintenance Menu)	The Maintenance menu has the following options to configure and troubleshoot the switch: • SYSTEM HALT?—Choose one of the following: ◦ Press the **Enter** button to halt the switch. Press the **Enter** button again to confirm the halt. ◦ Press the **Menu** button to go to the next option in the Maintenance menu. • SYSTEM REBOOT?—Choose one of the following: ◦ Press the **Enter** button to reboot the switch. Press the **Enter** button again to confirm the reboot. ◦ Press the **Menu** button to go to the next option in the Maintenance menu. • LOAD RESCUE?—Choose one of the following: ◦ Press the **Enter** button to roll back the switch to the rescue configuration. Press the **Enter** button again to confirm the rollback. ◦ Press the **Menu** button to go to the next option in the Maintenance menu. • REQUEST VC PORT?—Choose one of the following: ◦ Press the **Enter** button to configure an uplink module port or an EX4200-24F network port to be a Virtual Chassis port (VCP) or to delete a VCP from the switch configuration (when you delete the VCP, the port is reset to an uplink module port or an EX4200-24F network port). ◦ Press the **Menu** button to go to the next option in the Maintenance menu. • FACTORY DEFAULT?—Choose one of the following: ◦ Press the **Enter** button to restore the switch to the factory default configuration. Press the **Enter** button again to confirm the restoration. ◦ Press the **Menu** button to go to the next option in the Maintenance menu. • ENTER EZSETUP?—Choose one of the following: ◦ Press the **Enter** button to launch EZSetup. Press the **Enter** button again to confirm the launch. NOTE: You can use the ENTER EZSETUP option only if the switch is in the factory default configuration. For information about EZSetup, see "Connecting and Configuring an EX Series Switch (J-Web Procedure)" on page 167. ◦ Press the **Menu** button to go to the next option in the Maintenance menu. • EXIT MAINT MENU?—Choose one of the following: ◦ Press the **Enter** button to exit the Maintenance menu. Then press the **Menu** button to go to the Idle menu. ◦ Press the **Menu** button to go to the System Halt option. If you do not want users to use Maintenance menu options, disable the entire menu or individual menu options. See Configuring the LCD Panel on EX Series Switches (CLI Procedure).

Related Topics

- Front Panel of an EX3200 Switch on page 7
- Front Panel of an EX4200 Switch on page 9
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167

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Field-Replaceable Units in EX3200 and EX4200 Switches

Field-replaceable units (FRUs) are components that you can replace at your site. The field-replaceable units (FRUs) in EX3200 and EX4200 switches are:

- Power supply
- Fan tray
- Uplink module
- SFP transceiver
- SFP+ transceiver
- XFP transceiver

NOTE: Uplink modules are not part of the standard package and must be ordered separately.

The power supply, fan tray, uplink module, and transceivers are hot-removable and hot-insertable: You can remove and replace them without powering off the switch or disrupting switch functions.

NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/csc/management/updateinstallbase.jsp. Failure to do so can result in significant delays if you need replacement parts. This note applies if you change the type of power supply or add a new type of uplink module. It does not apply if you replace these components with the same type of component.

Related Topics

- Uplink Modules in EX3200 and EX4200 Switches on page 34
- Installing a Power Supply in an EX3200 or EX4200 Switch on page 132
- Removing a Power Supply from an EX3200 or EX4200 Switch on page 174
- Installing a Fan Tray in an EX3200 or EX4200 Switch on page 133
- Removing a Fan Tray from an EX3200 or EX4200 Switch on page 176
- Installing an Uplink Module in an EX3200 or EX4200 Switch on page 135
- Removing an Uplink Module from an EX3200 or EX4200 Switch on page 177
- Installing a Transceiver in an EX Series Switch on page 137
- Removing a Transceiver from an EX Series Switch on page 179

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Chassis Status LEDs in EX3200 Switches

The front panel of an EX3200 switch has three LEDs on the far right side of the panel, next to the LCD panel (see Figure 9 on page 19).

Figure 9: Chassis Status LEDs in an EX3200 Switch

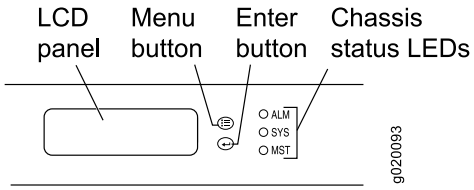

Table 5 on page 19 describes the chassis status LEDs in an EX3200 switch, their colors and states, and the status they indicate. You can view the colors of the three LEDs remotely through the CLI by issuing the operational mode command **show chassis lcd**.

Table 5: Chassis Status LEDs in an EX3200 Switch

LED Label	Color	State and Description
ALM (Alarm)	Unlit	There is no alarm.
	Red	There is a major alarm.
	Amber	There is a minor alarm.
SYS (System)	Green	• On steadily—Junos OS for EX Series switches has been loaded on the switch. • Blinking—The switch is booting.
MST (Master)	Green	This LED is always on and is meaningful only on EX4200 switches.

A major alarm (red) indicates a critical error condition that requires immediate action.

A minor alarm (amber) indicates a noncritical condition that requires monitoring or maintenance. A minor alarm that is left unchecked might cause interruption in service or performance degradation.

NOTE: The amber glow of the Alarm LED that indicates a minor alarm closely resembles the red glow that indicates a major alarm.

All three LEDs can be lit simultaneously.

Related Topics

- Front Panel of an EX3200 Switch on page 7
- Checking Active Alarms with the J-Web Interface
- Understanding Alarm Types and Severity Levels on EX Series Switches

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Chassis Status LEDs in EX4200 Switches

The front panel of an EX4200 switch has three LEDs on the far right side of the panel, next to the LCD panel (see Figure 10 on page 20).

Figure 10: Chassis Status LEDs in an EX4200 Switch

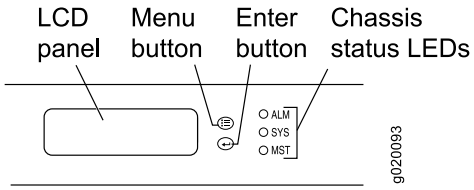

Table 6 on page 20 describes the chassis status LEDs in an EX4200 switch, their colors and states, and the status they indicate. You can view the colors of the three LEDs remotely through the CLI by issuing the operational mode command **show chassis lcd**.

Table 6: Chassis Status LEDs in an EX4200 Switch

LED Label	Color	State and Description
ALM (Alarm)	Unlit	There is no alarm.
	Red	There is a major alarm.
	Amber	There is a minor alarm.
SYS (System)	Green	• On steadily—Junos OS for EX Series switches has been loaded on the switch. • Blinking—The switch is booting.
MST (Master)	Green	• On steadily—The switch is the master in the Virtual Chassis configuration. • Blinking—The switch is the backup in the Virtual Chassis configuration. • Off—The switch is a linecard member in the Virtual Chassis configuration.

A major alarm (red) indicates a critical error condition that requires immediate action.

A minor alarm (amber) indicates a noncritical condition that requires monitoring or maintenance. A minor alarm that is left unchecked might cause interruption in service or performance degradation.

NOTE: The amber glow of the Alarm LED that indicates a minor alarm closely resembles the red glow that indicates a major alarm.

All three LEDs can be lit simultaneously.

Related Topics

- Front Panel of an EX4200 Switch on page 9

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- Checking Active Alarms with the J-Web Interface
- Understanding Alarm Types and Severity Levels on EX Series Switches

Network Port LEDs in EX3200 and EX4200 Switches

Each network port on an EX3200 or EX4200 switch has two LEDs. The four figures in this topic show the location of those LEDs:

- Figure 11 on page 21 shows the location of the LEDs on the network ports on the front panel.
- Figure 12 on page 21 shows the location of the LEDs on the uplink module ports on the SFP uplink module.
- Figure 13 on page 22 shows the location of the LEDs on the uplink module ports on the SFP+ uplink module.
- Figure 14 on page 22 shows the location of the LEDs on the uplink module ports on the XFP uplink module.

Figure 11: LEDs on the Network Ports on the Front Panel

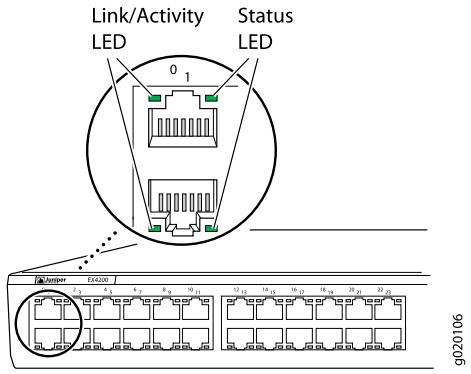

Figure 12: LEDs on the Uplink Module Ports on the SFP Uplink Module

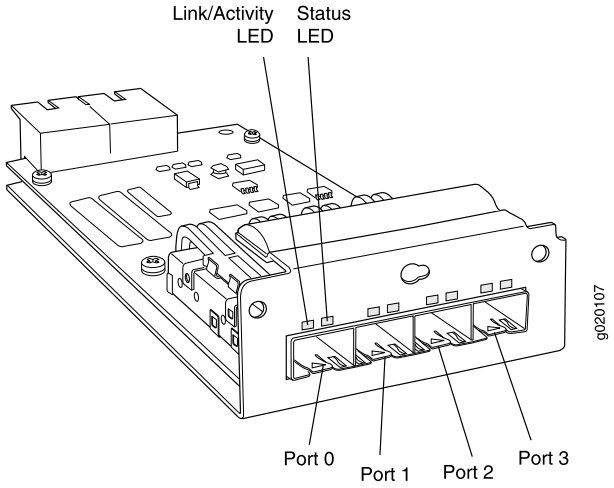

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Figure 13: LEDs on the Uplink Module Ports on the SFP+ Uplink Module

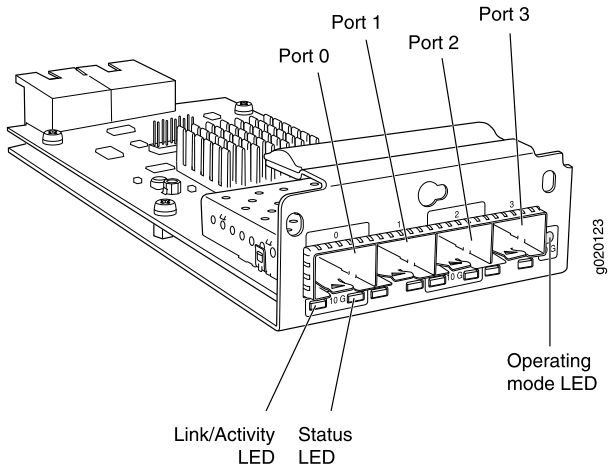
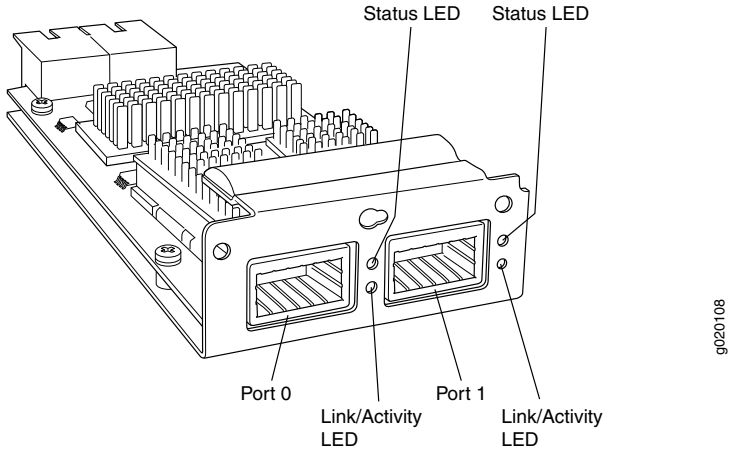


Figure 14: LEDs on the Uplink Module Ports on the XFP Uplink Module



The LEDs labeled Link/Activity LED in Figure 11 on page 21, Figure 12 on page 21, Figure 14 on page 22, and Figure 13 on page 22 indicate link activity. The LEDs labeled Status LED in Figure 11 on page 21, Figure 12 on page 21, Figure 14 on page 22, and Figure 13 on page 22 indicate the status of one of the four port parameters. The port parameters are administrative status, duplex mode, Power over Ethernet (PoE) status, and speed.

Table 7 on page 22 describes the Link/Activity LED.

Table 7: Link/Activity LED on Network Ports in EX3200 and EX4200 Switches

LED	Color	State and Description
Link/Activity	Green	• Blinking—The port and the link are active, and there is link activity. • On steadily—The port and the link are active, but there is no link activity. • Off—The port is not active.

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Table 8 on page 24 describes the Status LED. From the Idle menu of the LCD, use the **Enter** button on the LCD panel to toggle between the ADM, DPX, POE, and SPD indicators.

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Table 8: Status LED on Network Ports in EX3200 and EX4200 Switches

LED	LCD Indicator	State and Description
Status	LED: ADM	Indicates the administrative status (enabled or disabled). The status indicators are: • Green—Administrative status enabled. • Unlit—Administrative status disabled.
	LED: DPX	Indicates the duplex mode. The uplink module ports are always set to full-duplex; therefore, the LED is always green. The status indicators for network ports on the front panel are: • Green—Port is set to full-duplex mode. • Unlit—Port is set to half-duplex mode.

	LED: POE	Indicates the PoE status.
		PoE is not enabled on uplink module ports; therefore, the LED for those ports is always unlit.
		The status indicators for network ports on the front panel are:
		• Green—PoE is enabled on the port.
		• Amber—PoE is enabled on the port, but no power is drawn from the port because of one of the following:
		  ◦ No device that draws power from the port is connected to the port.
		  ◦ A device that draws power from the port is connected to the port, but the device is not drawing any power from the port.
		• Unlit—PoE is not enabled on the port.

	LED: SPD	

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Table 8: Status LED on Network Ports in EX3200 and EX4200 Switches *(continued)*

LED	LCD Indicator	State and Description
		Indicates the speed. The speed indicators for network ports on the front panel are: • One blink per second—10 Mbps • Two blinks per second—100 Mbps • Three blinks per second—1000 Mbps The speed indicators for network ports on the SFP uplink module are: • Green—1000 Mbps • Unlit—10/100 Mbps The speed indicators for network ports on the SFP+ uplink module are: • Green—The speed of the transceiver installed in the port is the same as the speed at which the uplink module port is configured to operate. • Unlit—The speed of the transceiver installed in the port is not the same as the speed at which the uplink module port is configured to operate. The speed of the XFP uplink module ports is always 10 Gbps; therefore, the LED is always green.

Related Topics

- Front Panel of an EX3200 Switch on page 7
- Front Panel of an EX4200 Switch on page 9
- Uplink Modules in EX3200 and EX4200 Switches on page 34
- LCD Panel in EX3200 and EX4200 Switches on page 13

Management Port LEDs in EX3200 and EX4200 Switches

The management port on EX3200 and EX4200 switches has two LEDs that indicate link/activity and port status (see Figure 15 on page 26 or Figure 16 on page 26). The management port is set to full-duplex and the speed is set to 100 Mbps.

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Figure 15: LEDs on the Management Port on an EX3200 Switch

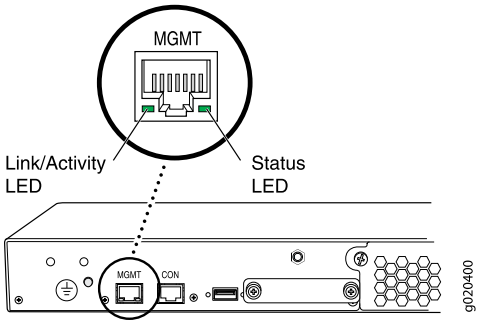

Figure 16: LEDs on the Management Port on an EX4200 Switch

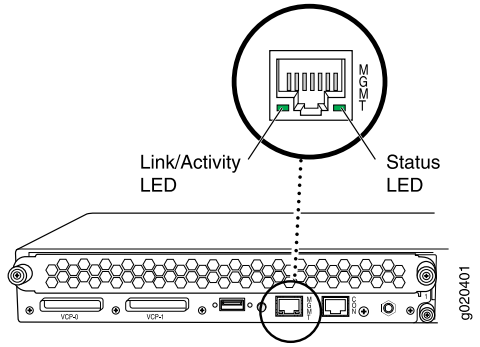

Table 9 on page 26 describes the Link/Activity LED.

Table 9: Link/Activity LED on the Management Port on EX3200 and EX4200 Switches

LED	Color	State and Description
Link/Activity	Green	• Blinking—The port and the link are active, and there is link activity. • On steadily—The port and the link are active, but there is no link activity. • Off—The port is not active.

Table 10 on page 26 describes the Status LED (administrative status).

Table 10: Status LED on the Management Port on EX3200 and EX4200 Switches

LED	Color	State and Description
Status	Green	• On steadily—Administrative status is enabled. • Off—Administrative status is disabled.

Related Topics

- See Rear Panel of an EX3200 Switch on page 8 for port location.
- See Rear Panel of an EX4200 Switch on page 11 for port location.
- Connecting an EX Series Switch to a Network for Out-of-Band Management on page 152

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Power Supply in EX3200 and EX4200 Switches

The power supply in EX3200 and EX4200 switches (see Figure 17 on page 28, Figure 18 on page 28 and Figure 19 on page 28) is a hot-removable and hot-insertable field-replaceable unit (FRU) that you can install on the rear panel without powering off the switch or disrupting the switching function. EX4200 switches have an internal redundant power supply, making the power supply in EX4200 switches fully redundant. The power supply in EX3200 switches is not redundant.

EX3200 and EX4200 switches use power that provides two DC output voltages: 12 V for system and logic power and 48–51 V (or higher, to compensate for voltage drops along the path from the power supplies to the RJ-45 connector) for PoE ports.

The AC power supply in EX3200 and EX4200 switches is available in 320 W, 600 W, and 930 W models. The exterior of the 600 W model is identical to that of the 930 W model. The 320 W power supply is flush with the chassis. The 600 W power supply and 930 W power supply extend out of the chassis by 2.25 in. The power cord retainer clips extend out of the power supply by 3 in. The number of ports on which PoE is enabled determines the minimum power requirements.

The DC power supply in EX3200 and EX4200 switches is available in a 190 W model, with dual input feeds for power resiliency. You can install redundant DC power supplies in an EX4200 switch to achieve both power supply and power feed resiliency.

NOTE: The DC power supply in EX3200 and EX4200 switches does not support Power over Ethernet (PoE); you can use either an external power injector or an AC power supply to supply power to PoE devices that you connect to the switch.

NOTE: The DC power supply in EX3200 and EX4200 switches has four terminals labeled A+, B+, A–, and B– (see Figure 19 on page 28) for connecting DC power source cables labeled positive (+) and negative (–). The DC power supplies for EX3200 and EX4200 switches are shipped with jumpers from A+ input to B+ input tied together and jumpers from A– input to B– input tied together.

NOTE: The A+ and B+ terminals are referred to as +RTN and A– and B– terminals are referred to as –48 V in “DC Power Wiring Sequence Warning for EX Series Switches” on page 244 and “DC Power Electrical Safety Guidelines for EX Series Switches” on page 240.

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Figure 17: 320 W AC Power Supply in EX3200 and EX4200 Switches

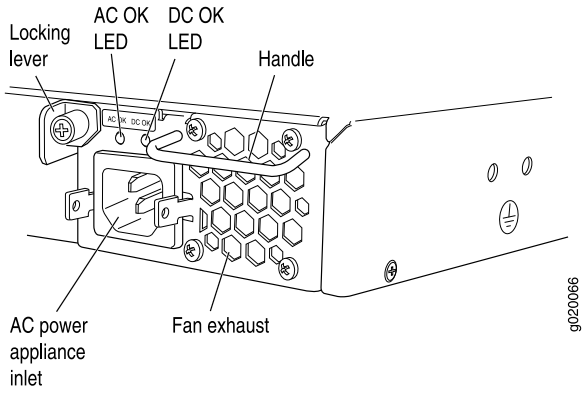

Figure 18: 600 W and 930 W AC Power Supplies in EX3200 and EX4200 Switches

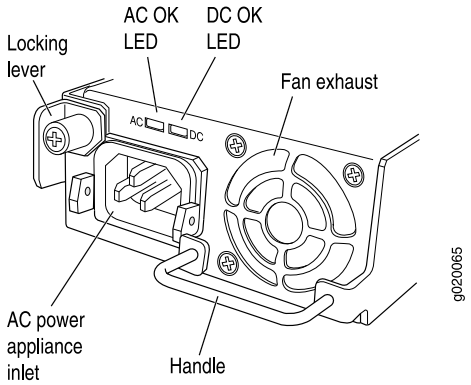

Figure 19: DC Power Supply in EX3200 and EX4200 Switches

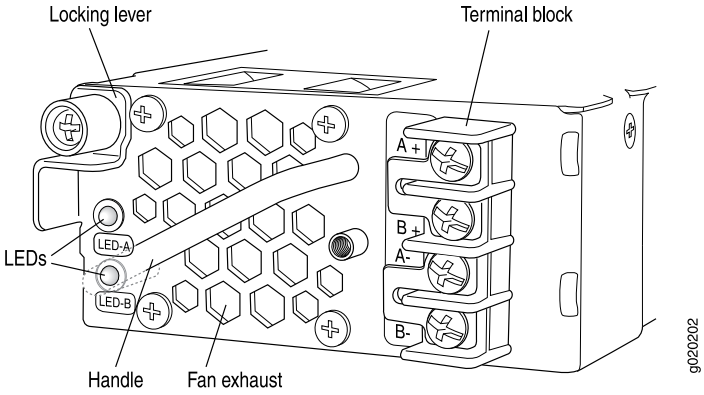

Table 11 on page 28 lists the minimum power requirements for each model of EX3200 switch. The maximum power available to each PoE port is 15.4 W.

Table 11: Minimum Power Requirements for an EX3200 Switch

Model Number	Number of PoE-enabled Ports	Minimum Power Requirement
EX3200-24T	8	320 W

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Table 11: Minimum Power Requirements for an EX3200 Switch *(continued)*

Model Number	Number of PoE-enabled Ports	Minimum Power Requirement
EX3200-48T	8	320 W
EX3200-24P	24	600 W
EX3200-48P	48	930 W
EX3200-24T-DC	0	190 W
EX3200-48T-DC	0	190 W

Table 12 on page 29 lists the minimum power requirements for each model of EX4200 switch. The maximum power available to each PoE port is 15.4 W.

Table 12: Minimum Power Requirements for an EX4200 Switch

Model Number	Number of PoE-enabled Ports	Minimum Power Requirement
EX4200-24T	8	320 W
EX4200-48T	8	320 W
EX4200-24P	24	600 W
EX4200-48P	48	930 W
EX4200-24F	–	320 W
EX4200-24T-DC	0	190 W
EX4200-48T-DC	0	190 W
EX4200-24F-DC	–	190 W

To avoid electrical injury, follow instructions in “Installing a Power Supply in an EX3200 or EX4200 Switch” on page 132 and “Removing a Power Supply from an EX3200 or EX4200 Switch” on page 174 carefully.

NOTE: After powering on an EX3200 or EX4200 switch, wait for at least 60 seconds before powering it off. After powering off an EX3200 or EX4200 switch, wait for at least 60 seconds before powering it back on.

After an EX3200 or EX4200 switch has been powered on, it can take up to 60 seconds for status indicators—such as LEDs on the power supply, **show chassis** command output, and messages on the LCD—to indicate that the power supply is functioning normally. Ignore error indicators that appear during the first 60 seconds.

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Related Topics

- AC Power Cord Specifications for EX3200 and EX4200 Switches on page 102
- AC Power Supply LEDs in EX3200 and EX4200 Switches on page 30
- DC Power Supply LEDs in EX3200 and EX4200 Switches on page 30
- Rear Panel of an EX3200 Switch on page 8
- Rear Panel of an EX4200 Switch on page 11
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Power Specifications for EX3200 and EX4200 Switches on page 101
- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236
- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Connecting Earth Ground to an EX Series Switch on page 141

AC Power Supply LEDs in EX3200 and EX4200 Switches

The AC power supply in an EX3200 or EX4200 switch is on the rear panel. Table 13 on page 30 describes the LEDs on the AC power supplies in EX3200 and EX4200 switches.

Table 13: AC Power Supply LEDs in EX3200 and EX4200 Switches

LED	State and Description
AC OK	• Off—Disconnected from power or power is not coming into the power supply. • On—Power is coming into the power supply.
DC OK	• Off—Power supply is not sending out power correctly. • On—Power supply is sending out power correctly.

NOTE: If the AC OK LED and the DC OK LED are unlit, either the AC power cord is not installed properly or the power supply fuse has failed. If the AC OK LED is lit and the DC OK LED is unlit, the AC power supply is not installed properly or the power supply has an internal failure.

Related Topics

- Power Supply in EX3200 and EX4200 Switches on page 27
- Connecting AC Power to an EX3200 or EX4200 Switch on page 147

DC Power Supply LEDs in EX3200 and EX4200 Switches

The DC power supply in an EX3200 or EX4200 switch is on the rear panel. Table 14 on page 31 describes the LEDs on the DC power supplies in EX3200 and EX4200 switches.

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Table 14: DC Power Supply LEDs in EX3200 and EX4200 Switches

LED Label	Color	Description
LED A	Red	Inputs A and B are normal, but there is no output.
LED B	Red	
LED A	Green	Inputs A and B are normal; output is normal.
LED B	Green	
LED A	Flash Red	Input A has failed because the power supply fuse has failed, input voltage is low, or there is a loose connection; output is normal.
LED B	Green	
LED A	Green	Input B has failed because the power supply fuse has failed, input voltage is low, or there is a loose connection; output is normal.
LED B	Flash Red	
LED A	Flash Red	Both inputs have failed because the power supply fuse has failed, input voltage is low, or there is a loose connection; output is normal.
LED B	Flash Red	
LED A	Off	There is no input; there is no output.
LED B	Off	

Related Topics

- Power Supply in EX3200 and EX4200 Switches on page 27
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149

Cooling System and Airflow in an EX3200 Switch

The cooling system in an EX3200 switch consists of a field-replaceable unit (FRU) fan tray with one fan (see Figure 20 on page 32). The fan tray is located at the rear of the chassis and provides side-to-rear chassis cooling (see Figure 21 on page 32).

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Figure 20: Fan Tray Used in an EX3200 Switch

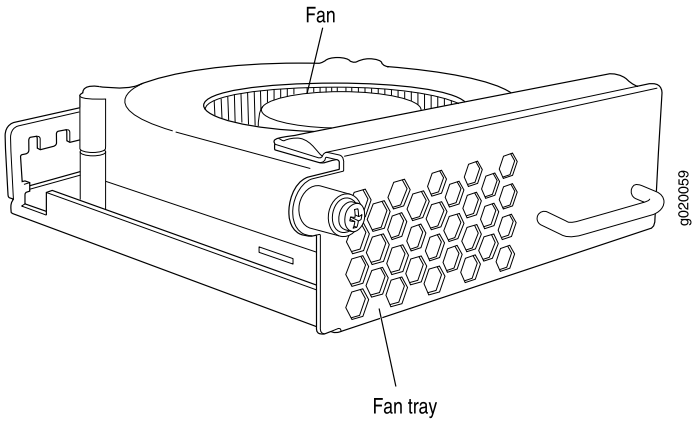
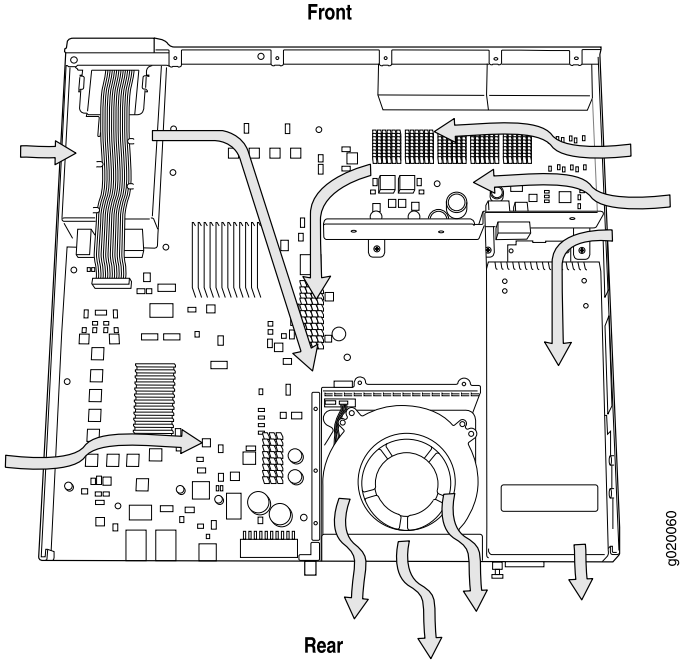


Figure 21: Airflow Through the EX3200 Switch Chassis



Temperature sensors in the chassis monitor the temperature within the chassis. The system raises an alarm if the fan fails or if the temperature inside the chassis rises above permitted levels. If the temperature inside the chassis rises above the threshold, the system shuts down automatically and the temperature shutdown LED on the rear panel is lit. You can see the status of fans and the temperature from the **Show Environment Status** option in the Status menu in the LCD panel.

Related Topics

- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Rear Panel of an EX3200 Switch on page 8
- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236
- Installing a Fan Tray in an EX3200 or EX4200 Switch on page 133

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- Removing a Fan Tray from an EX3200 or EX4200 Switch on page 176

Cooling System and Airflow in an EX4200 Switch

The cooling system in an EX4200 switch consists of a field-replaceable unit (FRU) fan tray with three fans (see Figure 22 on page 33). The fan tray is located at the rear of the chassis and provides side-to-rear chassis cooling (see Figure 23 on page 33).

Figure 22: Fan Tray Used in an EX4200 Switch

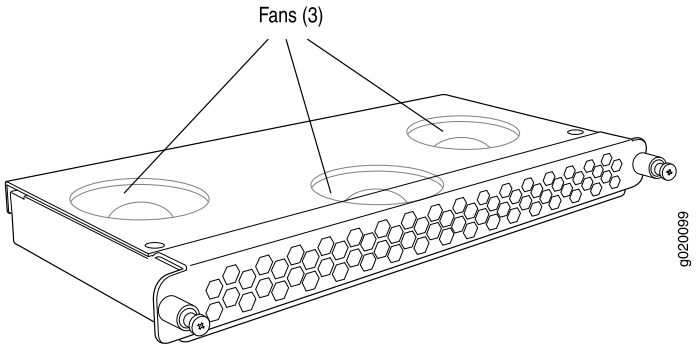
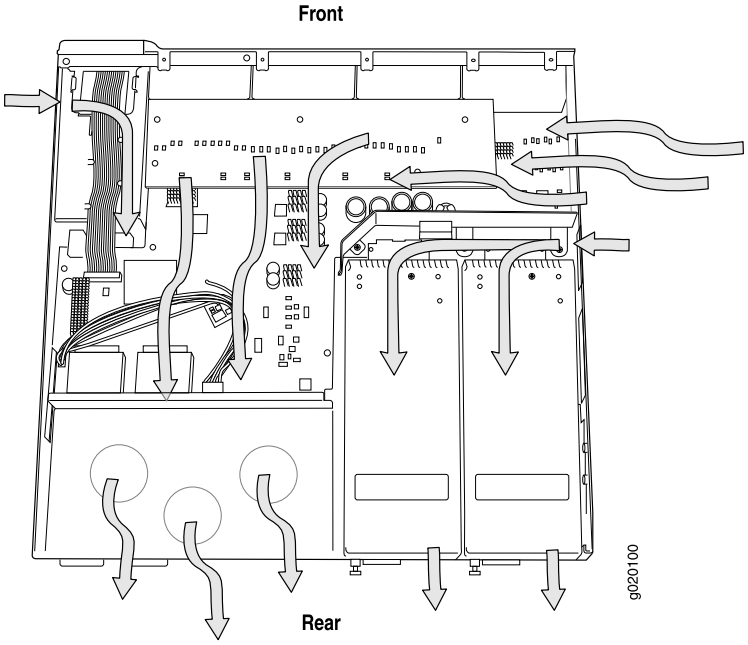


Figure 23: Airflow Through the EX4200 Switch Chassis



The fan tray used in an EX4200 switch comes with load-sharing redundancy that can tolerate a single fan failure at room temperature (below 45º C/113º F) to still provide sufficient cooling.

Temperature sensors in the chassis monitor the temperature within the chassis. The system raises an alarm if the fan fails or if the temperature inside the chassis rises above permitted levels. If the temperature inside the chassis rises above the threshold, the

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system shuts down automatically and the temperature shutdown LED on the rear panel is lit. You can see the status of fans and the temperature from the **Show Environment Status** option in the Status menu in the LCD panel.

Related Topics

- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Rear Panel of an EX4200 Switch on page 11
- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236
- Installing a Fan Tray in an EX3200 or EX4200 Switch on page 133
- Removing a Fan Tray from an EX3200 or EX4200 Switch on page 176

Uplink Modules in EX3200 and EX4200 Switches

EX3200 and EX4200 switches support three types of uplink modules:

- SFP uplink module—Provides four ports for 1-gigabit small form-factor pluggable (SFP) transceivers.
- SFP+ uplink module—Provides two ports for 10-gigabit small form-factor pluggable (SFP+) transceivers when configured to operate in 10-gigabit mode or four ports for 1-gigabit small form-factor pluggable (SFP) transceivers when configured to operate in 1-gigabit mode.
- XFP uplink module—Provides two ports for 10-gigabit small form-factor pluggable (XFP) transceivers.

NOTE: When a new uplink module is installed in the switch or an existing uplink module is replaced with another uplink module, the switch detects the newly installed uplink module. The switch creates the required interfaces if the uplink module has transceivers in its ports and when new transceivers are installed in those ports.

You can use the optional uplink module ports to connect an access switch to a distribution switch. You can also use these ports to connect members of a Virtual Chassis across multiple wiring closets.

When connecting uplink module ports, you can install an SFP uplink module at one end of the connection and install an SFP+ uplink module configured to operate in the 1-gigabit mode at the other end. Likewise, you can install an XFP uplink module at one end of the connection and install an SFP+ uplink module configured to operate in the 10-gigabit mode at the other end.

This topic describes:

- SFP Uplink Module on page 35
- SFP+ Uplink Module on page 35
- XFP Uplink Module on page 37

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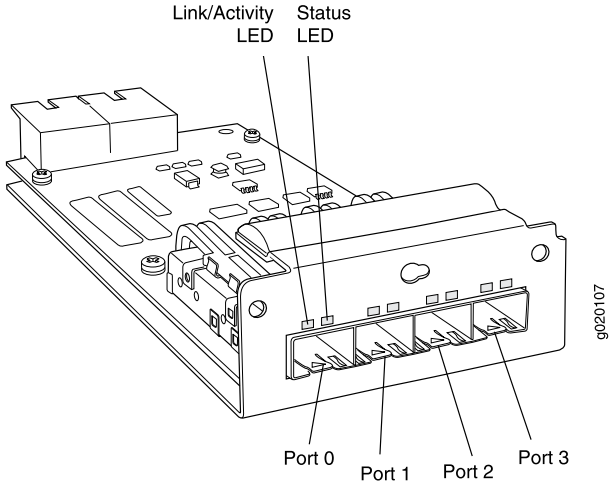
SFP Uplink Module

Figure 24 on page 35 shows the SFP uplink module, which provides four ports for 1-gigabit SFP transceivers.

Figure 24: SFP Uplink Module



SFP uplink modules are shipped with dust covers preinstalled in the ports.

NOTE: On an EX3200 switch, if you install a transceiver in an SFP uplink module, a corresponding network port from the last four built-in ports is disabled. For example, if you install an SFP transceiver in port 2 on the uplink module (ge-0/1/3), then ge-0/0/23 is disabled. The disabled port is not listed in the output of show interface commands.

The SFP uplink module requires Junos OS for EX Series switches, Release 9.0 or later.

SFP+ Uplink Module

SFP+ uplink modules can be used for either SFP+ or SFP transceivers. You configure the operating mode on the module to match the type of transceiver you want to use—for SFP+ transceivers, you configure the 10-gigabit operating mode, and for SFP transceivers, you configure the 1-gigabit operating mode. See Setting the Mode on an SFP+ Uplink Module (CLI Procedure).

By default, the SFP+ uplink module operates in the 10-gigabit mode and supports only SFP+ transceivers. If you have not changed the module from the default setting and you want to use SFP+ transceivers, you do not need to configure the operating mode.

If the operating mode and the configured mode for an SFP+ uplink module are different, it is shown in the output of **show chassis pic fpc-slot *slot number* pic-slot 1**.

Figure 25 on page 36 shows the SFP+ uplink module.

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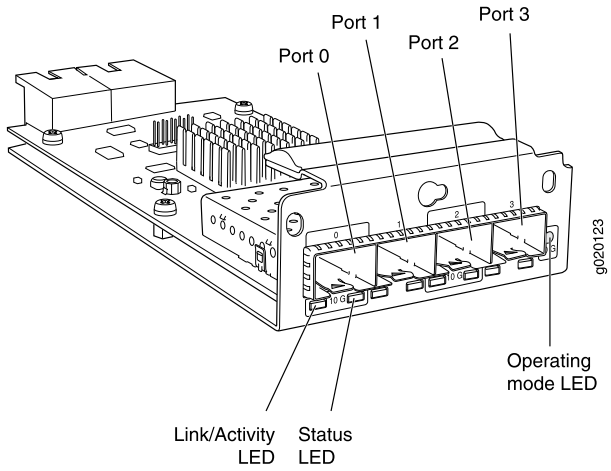
Figure 25: SFP+ Uplink Module



Transceivers are supported in the uplink module's ports as follows:

- SFP+ transceivers are supported in ports 0 and 2.
- SFP transceivers are supported in all four ports.

The ports that support SFP+ transceivers are labeled 10 G on the uplink module's faceplate (see Figure 25 on page 36).

NOTE: When an SFP+ uplink module is operating in 10-gigabit mode:

- Only the 10-gigabit ports (ports 0 and 2) are enabled.
- You can use only SFP+ transceivers in those ports.

When an SFP+ uplink module is operating in 1-gigabit mode:

- All four ports are enabled.
- You can use only SFP transceivers in all four ports.

The SFP+ uplink module has an LED on the faceplate (labeled Operating mode LED in Figure 25 on page 36) that indicates the operating mode. If the uplink module is operating in the 10-gigabit mode, the LED is lit. If the uplink module is operating in the 1-gigabit mode, the LED is unlit.

SFP+ uplink modules are shipped with dust covers preinstalled in the ports.

NOTE: On an EX3200 switch, if you install a transceiver in an SFP+ uplink module when the uplink module is operating in the 1-gigabit mode, a corresponding network port from the last four built-in ports is disabled. For example, if you install an SFP+ transceiver in port 2 on the uplink module (ge-0/1/3), then ge-0/0/23 is disabled. The disabled port is not listed in the output of show interface commands.

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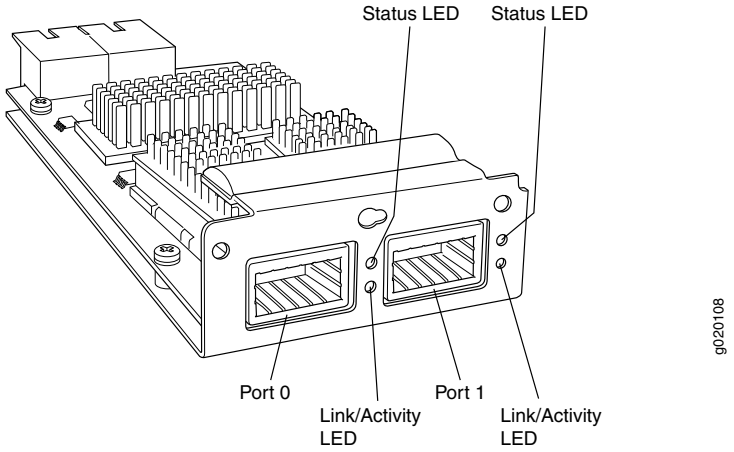
The SFP+ uplink module requires Junos OS for EX Series switches, Release 9.4 or later.

XFP Uplink Module

Figure 26 on page 37 shows the XFP uplink module, which provides two ports for 10-gigabit XFP transceivers.

Figure 26: XFP Uplink Module



XFP uplink modules are shipped with a dust cover preinstalled in one port.

The XFP uplink module requires Junos OS for EX Series switches, Release 9.0 or later.

Related Topics

- Network Port LEDs in EX3200 and EX4200 Switches on page 21
- Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches on page 73
- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- SFP+ Direct Attach Cables for EX Series Switches on page 69
- Example: Configuring Aggregated Ethernet High-Speed Uplinks Between a Virtual Chassis Access Switch and a Virtual Chassis Distribution Switch
- Example: Configuring Aggregated Ethernet High-Speed Uplinks with LACP Between a Virtual Chassis Access Switch and a Virtual Chassis Distribution Switch
- Installing an Uplink Module in an EX3200 or EX4200 Switch on page 135
- Troubleshooting Uplink Module Installation or Replacement on EX3200 and EX4200 Switches on page 194

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CHAPTER 3

Component Specifications

- USB Port Specifications for an EX Series Switch on page 39
- Network Port Connector Pinout Information for an EX3200 or EX4200 Switch on page 40
- Console Port Connector Pinout Information for an EX Series Switch on page 41
- Management Port Connector Pinout Information for an EX3200 or EX4200 Switch on page 42
- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- SFP+ Direct Attach Cables for EX Series Switches on page 69
- Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches on page 73
- Virtual Chassis Ports Connector Pinout Information for EX4200 Switches on page 81

USB Port Specifications for an EX Series Switch

The following Juniper Networks USB flash drives have been tested and are officially supported for the USB port on all EX Series switches:

- RE-USB-1G-S
- RE-USB-2G-S
- RE-USB-4G-S

CAUTION: Any USB memory product not listed as supported for EX Series switches has not been tested by Juniper Networks. The use of any unsupported USB memory product could expose your EX Series switch to unpredictable behavior. Juniper Networks Technical Assistance Center (JTAC) can provide only limited support for issues related to unsupported hardware. We strongly recommend that you use only supported USB flash drives.

All USB flash drives used on EX Series switches must have the following features:

- USB 2.0 or later.
- Formatted with a FAT or MS-DOS file system.

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- If the switch is running Junos OS Release 9.5 or earlier, the formatting method must use a master boot record. Windows formatting, by default, does not use a master boot record. See the documentation for your USB flash drive for information on how your USB flash drive is formatted.

Related Topics

- See Rear Panel of an EX2200 Switch for port location.
- See Rear Panel of an EX3200 Switch on page 8 for port location.
- See Rear Panel of an EX4200 Switch on page 11 for port location.
- See Front Panel of an EX4500 Switch for port location.
- See Switch Fabric and Routing Engine (SRE) Module in an EX8208 Switch for port location.
- See Routing Engine (RE) Module in an EX8216 Switch for port location.
- Booting an EX Series Switch Using a Software Package Stored on a USB Flash Drive

Network Port Connector Pinout Information for an EX3200 or EX4200 Switch

A network port on an EX3200 or EX4200 switch uses an RJ-45 connector to connect to a device.

The port uses an autosensing RJ-45 connector to support a 10/100/1000Base-T connection. Two LEDs on the port indicate link/activity on the port and the port status. See “Network Port LEDs in EX3200 and EX4200 Switches” on page 21.

Table 15 on page 40 provides the pinout information for the RJ-45 connector. An RJ-45 cable, with a connector attached, is supplied with the switch.

Table 15: Network Port Connector Pinout Information for an EX3200 or EX4200 Switch

Pin	Signal	Description
1	TRP1+	Transmit/receive data pair 1 Negative Vport (in PoE models)
2	TRP1-	Transmit/receive data pair 1 Negative Vport (in PoE models)
3	TRP2+	Transmit/receive data pair 2 Positive Vport (in PoE models)
4	TRP3+	Transmit/receive data pair 3
5	TRP3-	Transmit/receive data pair 3
6	TRP2-	Transmit/receive data pair 2 Positive Vport (in PoE models)

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Table 15: Network Port Connector Pinout Information for an EX3200 or EX4200 Switch *(continued)*

Pin	Signal	Description
7	TRP4+	Transmit/receive data pair 4
8	TRP4-	Transmit/receive data pair 4

Related Topics
- Front Panel of an EX3200 Switch on page 7
- Front Panel of an EX4200 Switch on page 9

Console Port Connector Pinout Information for an EX Series Switch

The console port on an EX Series switch is an RS-232 serial interface that uses an RJ-45 connector to connect to a console management device. The default baud rate for the console port is 9600 baud.

Table 16 on page 41 provides the pinout information for the RJ-45 console connector. An RJ-45 cable and an RJ-45 to DB-9 serial port adapter are supplied with the switch.

NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to an EX Series switch, use a combination of the RJ-45 to DB-9 female adapter supplied with the switch and a USB to DB-9 male adapter. You must provide the USB to DB-9 male adapter.

Table 16: EX Series Switches Console Port Connector Pinout Information

Pin	Signal	Description
1	RTS Output	Request to send
2	DTR Output	Data terminal ready
3	TxD Output	Transmit data
4	Signal Ground	Signal ground
5	Signal Ground	Signal ground
6	RxD Input	Receive data
7	CD Input	Data carrier detect
8	CTS Input	Clear to send

Related Topics
- See Rear Panel of an EX2200 Switch for port location.

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- See Rear Panel of an EX3200 Switch on page 8 for port location.
- See Rear Panel of an EX4200 Switch on page 11 for port location.
- See Front Panel of an EX4500 Switch for port location.
- See Switch Fabric and Routing Engine (SRE) Module in an EX8208 Switch for port location.
- See Routing Engine (RE) Module in an EX8216 Switch for port location.
- Connecting an EX Series Switch to a Management Console on page 153

Management Port Connector Pinout Information for an EX3200 or EX4200 Switch

The management port on an EX3200 or EX4200 switch uses an RJ-45 connector to connect to a management device for out-of-band management.

The port uses an autosensing RJ-45 connector to support a 10/100/1000Base-T connection. Two LEDs on the port indicate link/activity on the port and the administrative status of the port. See "Management Port LEDs in EX3200 and EX4200 Switches" on page 25.

Table 17 on page 42 provides the pinout information of the RJ-45 connector. An RJ-45 cable, with a connector attached, is supplied with the switch.

Table 17: Management Port Connector Pinout Information for EX3200 and EX4200 Switches

Pin	Signal	Description
1	TRP1+	Transmit/receive data pair 1
2	TRP1-	Transmit/receive data pair 1
3	TRP2+	Transmit/receive data pair 2
4	TRP3+	Transmit/receive data pair 3
5	TRP3-	Transmit/receive data pair 3
6	TRP2-	Transmit/receive data pair 2
7	TRP4+	Transmit/receive data pair 4
8	TRP4-	Transmit/receive data pair 4

Related Topics

- See Rear Panel of an EX3200 Switch on page 8 for port location.
- See Rear Panel of an EX4200 Switch on page 11 for port location.
- Connecting an EX Series Switch to a Network for Out-of-Band Management on page 152

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Optical Interface Support in EX3200 and EX4200 Switches

Optional uplink modules for EX3200 and EX4200 switches support SFP, SFP+, or XFP transceivers. This topic describes the optical interfaces supported for those transceivers. It also lists the copper interface supported for the SFP transceivers.

NOTE: Use only optical transceivers and optical connectors purchased from Juniper Networks for your EX Series switch.

The Gigabit Ethernet SFP, SFP+, or XFP transceivers installed in EX3200 or EX4200 switches support digital optical monitoring (DOM): you can view the diagnostic details for these transceivers by issuing the operational mode CLI command **show interfaces diagnostics optics**. The command does not give any output for copper transceivers, Fast Ethernet transceivers, or transceivers not purchased from Juniper Networks.

The tables in this topic describe the optical interface support over single-mode fiber-optic (SMF) and multimode fiber-optic (MMF) cables for SFP, SFP+, and XFP transceivers and over the copper interface for SFP transceivers:

- Table 18 on page 44—Optical interface support and copper interface support for Gigabit Ethernet SFP transceivers.
- Table 19 on page 55—Optical interface support for Fast Ethernet SFP transceivers.
- Table 20 on page 61—Optical interface support for Gigabit Ethernet SFP+ transceivers.
- Table 21 on page 66—Optical interface support for Gigabit Ethernet XFP transceivers.

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches

Ethernet Standard	Specifications	
1000Base-T	Model Number	EX-SFP-1GE-T
	Rate	10/100/1000 Mbps
	Connector Type	RJ-45
	Fiber Count	Copper
	Transmitter Wavelength	–
	Minimum Launch Power	–
	Maximum Launch Power	–
	Minimum Receiver Sensitivity	–
	Maximum Input Power	–
	Fiber Type	Copper
	Core/Cladding Size	–
	Modal Bandwidth	–
	Distance	100 m (328 ft)
	DOM Support	Not available
	Software required	Junos OS for EX Series switches, Release 9.0 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications				
1000Base-SX	Model Number	EX-SFP-1GE-SX			
	Rate	1000 Mbps			
	Connector Type	LC			
	Fiber Count	Dual			
	Transmitter Wavelength	850 nm			
	Minimum Launch Power	–9.5 dBm			
	Maximum Launch Power	–3 dBm			
	Minimum Receiver Sensitivity	–21 dBm			
	Maximum Input Power	0 dBm			
	Fiber Type	MMF			
	Core/Cladding Size	62.5/125 µm	62.5/125 µm	50/125 µm	50/125 µm
	Fiber Grade	FDDI	OM1	–	OM2
	Modal Bandwidth	160 MHz/km	200 MHz/km	400 MHz/km	500 MHz/km
	Distance	220 m (722 ft)	275 m (902 ft)	500 m (1640 ft)	550 m (1804 ft)
	DOM Support	Available			
	Software required	Junos OS for EX Series switches, Release 9.0 or later			

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-LX	Model Number	EX-SFP-1GE-LX
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1310 nm
	Minimum Launch Power	–9.5 dBm
	Maximum Launch Power	–3 dBm
	Minimum Receiver Sensitivity	–25 dBm
	Maximum Input Power	–3 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	10 km (6.2 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.0 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-BX-U	Model Number	EX-SFP-GE10KT13R14
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1310 nm
	Receiver Wavelength	1490 nm
	Minimum Launch Power	–9 dBm
	Maximum Launch Power	–3 dBm
	Minimum Receiver Sensitivity	–30 dBm
	Maximum Input Power	–3 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	10 km (6.2 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.4 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-BX-D	Model Number	EX-SFP-GE10KT14R13
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1490 nm
	Receiver Wavelength	1310 nm
	Minimum Launch Power	–9 dBm
	Maximum Launch Power	–3 dBm
	Minimum Receiver Sensitivity	–30 dBm
	Maximum Input Power	–3 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	10 km (6.2 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.4 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-BX-U	Model Number	EX-SFP-GE10KT13R15
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1310 nm
	Receiver Wavelength	1550 nm
	Minimum Launch Power	–9 dBm
	Maximum Launch Power	–3 dBm
	Minimum Receiver Sensitivity	–3 dBm
	Maximum Input Power	–21 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	10 km (6.2 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.5 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-BX-D	Model Number	EX-SFP-GE10KT15R13
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1550 nm
	Receiver Wavelength	1310 nm
	Minimum Launch Power	–9 dBm
	Maximum Launch Power	–3 dBm
	Minimum Receiver Sensitivity	–3 dBm
	Maximum Input Power	–21 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	10 km (6.2 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.5 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-BX-U	Model Number	EX-SFP-GE40KT13R15
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1310 nm
	Receiver Wavelength	1550 nm
	Minimum Launch Power	–6.5 dBm
	Maximum Launch Power	2 dBm
	Minimum Receiver Sensitivity	–3 dBm
	Maximum Input Power	–23 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	40 km (24.8 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.5 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-BX-D	Model Number	EX-SFP-GE40KT15R13
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1550 nm
	Receiver Wavelength	1310 nm
	Minimum Launch Power	–6.5 dBm
	Maximum Launch Power	2 dBm
	Minimum Receiver Sensitivity	–3 dBm
	Maximum Input Power	–23 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	40 km (24.8 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.5 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-LX	Model Number	EX-SFP-1GE-LX40K
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1310 nm
	Minimum Launch Power	–14 dBm
	Maximum Launch Power	–8 dBm
	Minimum Receiver Sensitivity	–45 dBm
	Maximum Input Power	–3 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	40 km (24.8 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.4 or later

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Table 18: Optical Interface Support and Copper Interface Support for Gigabit Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
1000Base-LH (or 1000Base-ZX)	Model Number	EX-SFP-1GE-LH
	Rate	1000 Mbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1550 nm
	Minimum Launch Power	–2 dBm
	Maximum Launch Power	5 dBm
	Minimum Receiver Sensitivity	–25 dBm
	Maximum Input Power	–3 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	70 km (43.5 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.0 or later

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Table 19: Optical Interface Support for Fast Ethernet SFP Transceivers in EX3200 and EX4200 Switches

Ethernet Standard	Specifications	
100Base-FX	Model Number	EX-SFP-1FE-FX
	Rate	100 Mbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1310 nm
	Minimum Launch Power	–20 dBm
	Maximum Launch Power	–14 dBm
	Minimum Receiver Sensitivity	–32.5 dBm
	Maximum Input Power	–8 dBm
	Fiber Type	MMF
	Core/Cladding Size	62.5/125 µm
	Fiber Grade	FDDI/OM1
	Modal Bandwidth	500 Mhz/km
	Distance	2 km (1.2 miles)
	DOM Support	Not available
	Software required	Junos OS for EX Series switches, Release 9.2 or later

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Table 19: Optical Interface Support for Fast Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
100Base-LX	Model Number	EX-SFP-1FE-LX
	Rate	100 Mbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1310 nm
	Minimum Launch Power	–15 dBm
	Maximum Launch Power	–8 dBm
	Minimum Receiver Sensitivity	–31.5 dBm
	Maximum Input Power	–8 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	10 km (6.2 miles)
	DOM Support	Not available
	Software required	Junos OS for EX Series switches, Release 9.5 or later

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Table 19: Optical Interface Support for Fast Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
100Base-BX-U	Model Number	EX-SFP-FE20KT13R15
	Rate	100 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1310 nm
	Receiver Wavelength	1550 nm
	Minimum Launch Power	–14 dBm
	Maximum Launch Power	–8 dBm
	Minimum Receiver Sensitivity	–45 dBm
	Maximum Input Power	–8 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	20 km (12.4 miles)
	DOM Support	Not available
	Software required	Junos OS for EX Series switches, Release 9.3 or later

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Table 19: Optical Interface Support for Fast Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
100Base-BX-D	Model Number	EX-SFP-FE20KT15R13
	Rate	100 Mbps
	Connector Type	LC
	Fiber Count	Single
	Transmitter Wavelength	1550 nm
	Receiver Wavelength	1310 nm
	Minimum Launch Power	–14 dBm
	Maximum Launch Power	–8 dBm
	Minimum Receiver Sensitivity	–45 dBm
	Maximum Input Power	–8 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	20 km (12.4 miles)
	DOM Support	Not available
	Software required	Junos OS for EX Series switches, Release 9.3 or later

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Table 19: Optical Interface Support for Fast Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
100Base-LX40K	Model Number	EX-SFP-1FE-LX40K
	Rate	100 Mbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1310 nm
	Minimum Launch Power	–5 dBm
	Maximum Launch Power	0 dBm
	Minimum Receiver Sensitivity	–32 dBm
	Maximum Input Power	–8 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	40 km (24.8 miles)
	DOM Support	Not available
	Software required	Junos OS for EX Series switches, Release 10.0 or later

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Table 19: Optical Interface Support for Fast Ethernet SFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
100Base-LH (or 100Base-ZX)	Model Number	EX-SFP-1FE-LH
	Rate	100 Mbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1310 nm
	Minimum Launch Power	–5 dBm
	Maximum Launch Power	0 dBm
	Minimum Receiver Sensitivity	–32 dBm
	Maximum Input Power	–8 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	80 km (49.7 miles)
	DOM Support	Not available
	Software required	Junos OS for EX Series switches, Release 10.0 or later

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Table 20: Optical Interface Support for Gigabit Ethernet SFP+ Transceivers in EX3200 and EX4200 Switches

Ethernet Standard	Specifications			
10GBase-SR	Model Number	EX-SFP-10GE-USR		
	Rate	10 Gbps		
	Connector Type	LC		
	Fiber Count	Dual		
	Transmitter Wavelength	850 nm		
	Minimum Launch Power	–7.3 dBm		
	Maximum Launch Power	–1.3 dBm		
	Minimum Receiver Sensitivity	–11.1 dBm		
	Maximum Input Power	–9.9 dBm		
	Fiber Type	MMF		
	Core/Cladding Size	62.5/125 µm	50/125 µm	50/125 µm
	Fiber Grade	OM1	OM3	OM3
	Modal Bandwidth	200 MHz/km	500 MHz/km	1500 MHz/km
	Distance	10 m (32.8 ft)	30 m (98.4 ft)	100 m (328 ft)
	DOM Support	Available		
	Software required	Junos OS for EX Series switches, Release 10.2 or later		

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Table 20: Optical Interface Support for Gigabit Ethernet SFP+ Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications					
10GBase-SR	Model Number	EX-SFP-10GE-SR				
	Rate	10 Gbps				
	Connector Type	LC				
	Fiber Count	Dual				
	Transmitter Wavelength	850 nm				
	Minimum Launch Power	–7.3 dBm				
	Maximum Launch Power	–1 dBm				
	Minimum Receiver Sensitivity	–9.9 dBm				
	Maximum Input Power	–1 dBm				
	Fiber Type	MMF				
	Core/Cladding Size	62.5/125 µm	62.5/125 µm	50/125 µm	50/125 µm	50/125 µm
	Fiber Grade	FDDI	OM1	–	OM2	OM3
	Modal Bandwidth	160 MHz/km	200 MHz/km	400 MHz/km	500 MHz/km	1500 MHz/km
	Distance	26 m (85 ft)	33 m (108 ft)	66 m (216 ft)	82 m (269 ft)	300 m (984 ft)
	DOM Support	Available				
	Software required	Junos OS for EX Series switches, Release 9.4 or later				

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Table 20: Optical Interface Support for Gigabit Ethernet SFP+ Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications			
10GBase-LRM	Model Number	EX-SFP-10GE-LRM		
	Rate	10 Gbps		
	Connector Type	LC		
	Fiber Count	Dual		
	Transmitter Wavelength	1310 nm		
	Minimum Launch Power	–6.5 dBm		
	Maximum Launch Power	0.5 dBm		
	Minimum Receiver Sensitivity	–21 dBm		
	Maximum Input Power	0.5 dBm		
	Fiber Type	MMF		
	Core/Cladding Size	62.5/125µm	50/125 µm	50/125 µm
	Fiber Grade	FDDI/OM1	OM2	OM3
	Modal Bandwidth	500 MHz/km	500 MHz/km	500 MHz/km
	Distance	220 m (722 ft)	220 m (722 ft)	220 m (722 ft)
	DOM Support	Available		
	Software required	Junos OS for EX Series switches, Release 9.5 or later		

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Table 20: Optical Interface Support for Gigabit Ethernet SFP+ Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
10GBase-LR	Model Number	EX-SFP-10GE-LR
	Rate	10 Gbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1310 nm
	Minimum Launch Power	–8.2 dBm
	Maximum Launch Power	0.5 dBm
	Minimum Receiver Sensitivity	–18 dBm
	Maximum Input Power	0.5 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	10 km (6.2 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.4 or later

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Table 20: Optical Interface Support for Gigabit Ethernet SFP+ Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
10GBase-ER	Model Number	EX-SFP-10GE-ER
	Rate	10 Gbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1550 nm
	Minimum Launch Power	–4.7 dBm
	Maximum Launch Power	4 dBm
	Minimum Receiver Sensitivity	–11.3 dBm
	Maximum Input Power	–1 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	40 km (24.8 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 10.3 or later

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Table 21: Optical Interface Support for Gigabit Ethernet XFP Transceivers in EX3200 and EX4200 Switches

Ethernet Standard	Specifications					
10GBase-SR	Model Number	EX-XFP-10GE-SR				
	Rate	10 Gbps				
	Connector Type	LC				
	Fiber Count	Dual				
	Transmitter Wavelength	850 nm				
	Minimum Launch Power	–7.3 dBm				
	Maximum Launch Power	–1.3 dBm				
	Minimum Receiver Sensitivity	–11.1 dBm				
	Maximum Input Power	–1 dBm				
	Fiber Type	MMF				
	Core/Cladding Size	62.5/125 µm	62.5/125 µm	50/125 µm	50/125 µm	50/125 µm
	Fiber Grade	FDDI	OM1	–	OM2	OM3
	Modal Bandwidth	160 MHz/km	200 MHz/km	400 MHz/km	500 MHz/km	1500 MHz/km
	Distance	26 m (85 ft)	33 m (108 ft)	66 m (216 ft)	82 m (269 ft)	300 m (984 ft)
	DOM Support	Available				
	Software required	Junos OS for EX Series switches, Release 9.0 or later				

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Table 21: Optical Interface Support for Gigabit Ethernet XFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
10GBase-LR	Model Number	EX-XFP-10GE-LR
	Rate	10 Gbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1310 nm
	Minimum Launch Power	–8.2 dBm
	Maximum Launch Power	1 dBm
	Minimum Receiver Sensitivity	–18 dBm
	Maximum Input Power	0.5 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	10 km (6.2 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.0 or later

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Table 21: Optical Interface Support for Gigabit Ethernet XFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
10GBase-ER	Model Number	EX-XFP-10GE-ER
	Rate	10 Gbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1550 nm
	Minimum Launch Power	–5 dBm
	Maximum Launch Power	2 dBm
	Minimum Receiver Sensitivity	–22 dBm
	Maximum Input Power	–1 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	40 km (24.8 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.0 or later

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Table 21: Optical Interface Support for Gigabit Ethernet XFP Transceivers in EX3200 and EX4200 Switches *(continued)*

Ethernet Standard	Specifications	
10GBase-ZR	Model Number	EX-XFP-10GE-ZR
	Rate	10 Gbps
	Connector Type	LC
	Fiber Count	Dual
	Transmitter Wavelength	1550 nm
	Minimum Launch Power	0
	Maximum Launch Power	4 dBm
	Minimum Receiver Sensitivity	–30 dBm
	Maximum Input Power	–7 dBm
	Fiber Type	SMF
	Core/Cladding Size	9/125 µm
	Modal Bandwidth	–
	Distance	80 km (49.7 miles)
	DOM Support	Available
	Software required	Junos OS for EX Series switches, Release 9.0 or later

Related Topics

- Uplink Modules in EX3200 and EX4200 Switches on page 34
- Installing a Transceiver in an EX Series Switch on page 137
- Removing a Transceiver from an EX Series Switch on page 179

SFP+ Direct Attach Cables for EX Series Switches

Small form-factor pluggable plus transceiver (SFP+) direct attach copper cables, also known as Twinax cables, are suitable for in-rack connections between servers and switches. They are suitable for short distances up to 7 m, making them ideal for highly cost-effective networking connectivity within a rack and between adjacent racks.

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This topic describes:

- Cable Specifications on page 70
- Standards Supported by These Cables on page 73

Cable Specifications

Juniper Networks SFP+ direct attach cables are available in four lengths:

- 1 m (3.3 ft)—Supported on EX3200, EX4200, EX4500, and EX8200 switches
- 3 m (9.9 ft)—Supported on EX3200, EX4200, EX4500, and EX8200 switches
- 5 m (16.4 ft)—Supported on EX3200, EX4200, and EX8200 switches
- 7 m (23 ft)—Supported on EX3200, EX4200, EX4500, and EX8200 switches

NOTE: When you use SFP+ direct attach cables with your EX Series switches, we recommend that you use only Juniper Networks SFP+ direct attach cables.

The cables are hot-removable and hot-insertable: You can remove and replace them without powering off the switch or disrupting switch functions. A cable comprises a low-voltage cable assembly that connects directly into two SFP+ modules, one at each end of the cable. The cables use high-performance integrated duplex serial data links for bidirectional communication and are designed for data rates up to 10 Gbps.

Table 22 on page 71 describes the cable specifications.

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Table 22: SFP+ Direct Attach Cable Specifications

Model	Specification	
EX-SFP-10GE-DAC-1m	Rate	10 Gbps full-duplex serial transmission
	Connector type	SFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.57 W
	Storage temperature	-40°C to 85°C
	Cable type	Twinax
	Wire AWG	30 AWG
	Minimum cable bend radius	1 in.
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	2% maximum
	Time delay	1.31 nsec/ft
	Length	1 m (3.3 ft)
EX-SFP-10GE-DAC-3m	Rate	10 Gbps full-duplex serial transmission
	Connector type	SFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.57 W
	Storage temperature	-40°C to 85°C
	Cable type	Twinax
	Wire AWG	30 AWG
	Minimum cable bend radius	1 in.
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	2% maximum
	Time delay	1.31 nsec/ft
	Length	3 m (9.9 ft)

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Table 22: SFP+ Direct Attach Cable Specifications *(continued)*

Model	Specification	
EX-SFP-10GE-DAC-5m	Rate	10 Gbps full-duplex serial transmission
	Connector type	SFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.57 W
	Storage temperature	-40°C to 85°C
	Cable type	Twinax
	Wire AWG	24 AWG
	Minimum cable bend radius	2 in.
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	2% maximum
	Time delay	1.31 nsec/ft
	Length	5 m (16.4 ft)
EX-SFP-10GE-DAC-7m	Rate	10 Gbps full-duplex serial transmission
	Connector type	SFP+ passive Twinax cable assembly
	Supply voltage	3.3 V
	Power consumption (per end)	0.57 W
	Storage temperature	-40°C to 85°C
	Cable type	Twinax
	Wire AWG	24 AWG
	Minimum cable bend radius	2 in.
	Cable characteristic impedance	100 ohms
	Crosstalk between pairs	2% maximum
	Time delay	1.31 nsec/ft
	Length	7 m (23 ft)

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Standards Supported by These Cables

The cables comply with the following standards:

- SFP mechanical standard SFF-843—see ftp://ftp.seagate.com/sff/SFF-8431.PDF.
- Electrical interface standard SFF-8432—see ftp://ftp.seagate.com/sff/SFF-8432.PDF.
- SFP+ Multi-Source Alliance (MSA) standards

Related Topics

- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- Optical Interface Support in EX4500 Switches
- Optical Interface Support in EX8200 Switches
- Installing a Transceiver in an EX Series Switch on page 137
- Removing a Transceiver from an EX Series Switch on page 179

Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches

EX3200 and EX4200 switches have a field-replaceable unit (FRU) uplink module on the front panel. Table 23 on page 73 provides the uplink modules connector pinout information.

NOTE: You can use these ports to connect an access switch to a distribution switch. You can also use optional uplink module ports to connect members of a Virtual Chassis across multiple wiring closets.

Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches

Pin Number	Pin Name
A1	GND
A2	GND
A3	GND
A4	GND
A5	GND
A6	GND
A7	GND
A8	GND
A9	GND

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Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches *(continued)*

Pin Number	Pin Name
A10	GND
A11	GND
A12	GND
A13	GND
A14	GND
A15	Uplink_I2C_SCK
A16	GND
A17	Uplink_PD
A18	GND
A19	POWER (12V)
A20	GND
B1	GND
B2	XAUI0_RX0N
B3	GND
B4	XAUI0_RX2N
B5	Uplink_P25_LED2
B6	XAUI1_RX0N
B7	Uplink_P27_LED2
B8	XAUI1_RX2N
B9	GND
B10	SRX28N
B11	Uplink_XAUI_XMDIO
B12	SRX26N

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Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches *(continued)*

Pin Number	Pin Name
B13	GND
B14	SGMIIRXN
B15	Uplink_I2C_Rst
B16	Uplink_Intr
B17	Uplink_Pwr_En
B18	Uplink_P26_LED0
B19	POWER (12V)
B20	POWER (12V)
C1	GND
C2	XAUI0_RX0P
C3	GND
C4	XAUI0_RX2P
C5	GND
C6	XAUI1_RX0P
C7	GND
C8	XAUI1_RX2P
C9	GND
C10	SRX28P
C11	GND
C12	SRX26P
C13	GND
C14	SGMIIRXP
C15	CPU_UPLINK_MDC

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Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches *(continued)*

Pin Number	Pin Name
C16	Uplink_I2C_SDA
C17	CPU_UPLINK_MDIO
C18	Uplink_P26_LED1
C19	UPLNK_PWR_OK
C20	POWER (12V)
D1	GND
D2	GND
D3	XAUI0_TX1N
D4	GND
D5	XAUI0_TX3N
D6	GND
D7	XAUI1_TX1N
D8	GND
D9	XAUI1_TX3N
D10	GND
D11	STX27N
D12	GND
D13	STX25N
D14	GND
D15	Uplink_Rst
D16	GND
D17	Uplink_Status_LED0
D18	GND

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Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches *(continued)*

Pin Number	Pin Name
D19	POWER (12V)
D20	GND
E1	GND
E2	XAUI0_TX0N
E3	XAUI0_TX1P
E4	XAUI0_TX2N
E5	XAUI0_TX3P
E6	XAUI1_TX0N
E7	XAUI1_TX1P
E8	XAUI1_TX2N
E9	XAUI1_TX3P
E10	STX28N
E11	STX27P
E12	STX26N
E13	STX25P
E14	SGMIITXN
E15	Uplink_Hotswap_LED
E16	Uplink_Spare_Intr
E17	Uplink_Status_LED1
E18	Uplink_P27_LED0
E19	POWER (12V)
E20	POWER (12V)
F1	GND

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Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches *(continued)*

Pin Number	Pin Name
F2	XAUI0_TX0P
F3	GND
F4	XAUI0_TX2P
F5	GND
F6	XAUI1_TX0P
F7	GND
F8	XAUI_TX2P
F9	GND
F10	STX28P
F11	GND
F12	STX26P
F13	GND
F14	SGMIITXP
F15	GND
F16	Uplink_Expander_Intr
F17	GND
F18	Uplink_P27_LED1
F19	GND
F20	POWER (12V)
G1	GND
G2	GND
G3	XAUI0_RX1N
G4	GND

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Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches *(continued)*

Pin Number	Pin Name
G5	XAUI0_RX3N
G6	GND
G7	XAUI1_RX1N
G8	GND
G9	XAUI1_RX3N
G10	GND
G11	SRX27N
G12	GND
G13	SRX25N
G14	GND
G15	GND
G16	GND
G17	Uplink_P25_LED0
G18	GND
G19	POWER (12V)
G20	GND
H1	Uplink_PD_Loopback
H2	GND
H3	XAUI0_RX1P
H4	GND
H5	XAUI0_RX3P
H6	Uplink_P26_ LED2
H7	XAUI1_RX1P

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Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches *(continued)*

Pin Number	Pin Name
H8	Uplink_P28_ LED2
H9	XAUI1_RX3P
H10	GND
H11	SRX27P
H12	Uplink_XAUI_MDC
H13	SRX25P
H14	GND
H15	Serial_RX
H16	GND
H17	Uplink_P25_LED1
H18	Uplink_P28_LED0
H19	POWER (12V)
H20	POWER (12V)
I1	GND
I2	GND
I3	GND
I4	GND
I5	GND
I6	GND
I7	GND
I8	GND
I9	GND
I10	GND

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Table 23: Uplink Modules Connector Pinout Information for EX3200 and EX4200 Switches *(continued)*

Pin Number	Pin Name
I11	GND
I12	GND
I13	GND
I14	GND
I15	GND
I16	Serial_TX
I17	GND
I18	Uplink_P28_LED1
I19	GND
I20	POWER (12V)

Related Topics

- Uplink Modules in EX3200 and EX4200 Switches on page 34
- Front Panel of an EX3200 Switch on page 7
- Front Panel of an EX4200 Switch on page 9
- Installing an Uplink Module in an EX3200 or EX4200 Switch on page 135
- Removing an Uplink Module from an EX3200 or EX4200 Switch on page 177

Virtual Chassis Ports Connector Pinout Information for EX4200 Switches

EX4200 switches use a 68-pin connector cable to interconnect switches to form a Virtual Chassis. The cable is provided with the switch. Table 24 on page 81 provides the Virtual Chassis ports (VCPs) connector pinout information.

Table 24: Virtual Chassis Ports (VCPs) Connector Pinout Information

Pin Number	Pin Name
A1	GND
A2	P1TXP0
A3	P1TXN0
A4	GND

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Table 24: Virtual Chassis Ports (VCPs) Connector Pinout Information *(continued)*

Pin Number	Pin Name
A5	P1TXP1
A6	P1TXN1
A7	GND
A8	P1TXP2
A9	P1TXN2
A10	GND
A11	P1TXP3
A12	P1TXN3
A13	GND
A14	NC
A15	NC
A16	GND
A17	NC
A18	NC
A19	NC
A20	NC
A21	NC
A22	GND
A23	P2TXP0
A24	P2TXN0
A25	GND
A26	P2TXP1
A27	P2TXN1
A28	GND

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Table 24: Virtual Chassis Ports (VCPs) Connector Pinout Information *(continued)*

Pin Number	Pin Name
A29	P2TXP2
A30	P2TXN2
A31	GND
A32	P2TXP3
A33	P2TXN3
A34	GND
B1	GND
B2	P1RXP0
B3	P1RXN0
B4	GND
B5	P1RXP1
B6	P1RXN1
B7	GND
B8	P1RXP2
B9	P1RXN2
B10	GND
B11	P1RXP3
B12	P1RXN3
B13	GND
B14	NC
B15	NC
B16	NC
B17	NC
B18	NC

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Table 24: Virtual Chassis Ports (VCPs) Connector Pinout Information *(continued)*

Pin Number	Pin Name
B19	NC
B20	NC
B21	NC
B22	GND
B23	P2RXP0
B24	P2RXN0
B25	GND
B26	P2RXP1
B27	P2RXN1
B28	GND
B29	P2RXP2
B30	P2RXN2
B31	GND
B32	P2RXP3
B33	P2RXN3
B34	GND

Related Topics

- Virtual Chassis Cabling Configuration Examples for EX4200 Switches on page 107
- Planning the Virtual Chassis on page 106
- Understanding Virtual Chassis Components
- Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch on page 105
- Connecting a Virtual Chassis Cable to an EX4200 Switch on page 139

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PART 2

Planning for Switch Installation

- Site Preparation on page 87
- Mounting and Clearance Requirements on page 93
- Cable Specifications on page 99
- Planning Power Requirements on page 101
- Planning the Virtual Chassis on page 105

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CHAPTER 4

Site Preparation

- Site Preparation Checklist for EX3200 and EX4200 Switches on page 87
- General Site Guidelines for EX Series Switches on page 89
- Site Electrical Wiring Guidelines for EX Series Switches on page 89
- Environmental Requirements and Specifications for EX Series Switches on page 90

Site Preparation Checklist for EX3200 and EX4200 Switches

The checklist in Table 25 on page 87 summarizes the tasks you need to perform when preparing a site for EX3200 or EX4200 switch installation.

Table 25: Site Preparation Checklist

Item or Task	For More Information	Performed By	Date
Environment			
Verify that environmental factors such as temperature and humidity do not exceed switch tolerances.	"Environmental Requirements and Specifications for EX Series Switches" on page 90		
Power			
Measure distance between external power sources and switch installation site.			
Locate sites for connection of system grounding.			
Calculate the power consumption and requirements.	"Power Specifications for EX3200 and EX4200 Switches" on page 101		
Hardware Configuration			
Choose the number and types of switches you want to install.	"EX3200 and EX4200 Switches Hardware Overview" on page 3		
Rack or Cabinet			

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Table 25: Site Preparation Checklist *(continued)*

Item or Task	For More Information	Performed By	Date
Verify that your rack or cabinet meets the minimum requirements for the installation of the switch.	"Rack Requirements for EX3200 and EX4200 Switches" on page 93 "Cabinet Requirements for EX3200 and EX4200 Switches" on page 94		
Plan rack or cabinet location, including required space clearances.	"Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches" on page 96		
Secure the rack or cabinet to the floor and building structure.			
Wall			
Verify that the wall meets the minimum requirements for the installation of the switch.	"Requirements for Mounting an EX3200 or EX4200 Switch on a Desktop or Wall" on page 95		
Verify that there is appropriate clearance in your selected location.	"Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches" on page 96		
Cables			
Acquire cables and connectors: • Determine the number of cables needed based on your planned configuration. • Review the maximum distance allowed for each cable. Choose the length of cable based on the distance between the hardware components being connected.			
Plan the cable routing and management.			

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Site Guidelines for EX Series Switches on page 89
- Installing and Connecting an EX3200 or EX4200 Switch on page 117
- Mounting an EX3200 or EX4200 Switch on page 120

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General Site Guidelines for EX Series Switches

Efficient switch operation requires proper site planning and maintenance and proper layout of the equipment, rack or cabinet (if used), and wiring closet.

To plan and create an acceptable operating environment for your EX Series switch and prevent environmentally caused equipment failures:

- Keep the area around the chassis free from dust and conductive material, such as metal flakes.
- Follow prescribed airflow guidelines to ensure that the cooling system functions properly and that exhaust from other equipment does not blow into the intake vents of the switch.
- Follow the prescribed ESD prevention procedures to avoid damaging the equipment. Static discharge can cause components to fail completely or intermittently over time.
- Install the switch in a secure area, so that only authorized personnel can access the switch.

Related Topics

- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236
- Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches
- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96
- Clearance Requirements for Airflow and Hardware Maintenance for EX4500 Switches
- Clearance Requirements for Airflow and Hardware Maintenance for an EX8208 Switch
- Clearance Requirements for Airflow and Hardware Maintenance for an EX8216 Switch
- Environmental Requirements and Specifications for EX Series Switches on page 90

Site Electrical Wiring Guidelines for EX Series Switches

Table 26 on page 90 describes the factors you must consider while planning the electrical wiring at your site.

WARNING: It is particularly important to provide a properly grounded and shielded environment and to use electrical surge-suppression devices.

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Table 26: Site Electrical Wiring Guidelines

Site Wiring Factor	Guidelines
Signaling limitations	If your site experiences any of the following problems, consult experts in electrical surge suppression and shielding: • Improperly installed wires cause radio frequency interference (RFI). • Damage from lightning strikes occurs when wires exceed recommended distances or pass between buildings. • Electromagnetic pulses (EMPs) caused by lightning damages unshielded conductors and electronic devices.
Radio frequency interference	To reduce or eliminate radio frequency interference (RFI) from your site wiring, do the following: • Use twisted-pair cable with a good distribution of grounding conductors. • If you must exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal when applicable.
Electromagnetic compatibility	If your site is susceptible to problems with electromagnetic compatibility (EMC), particularly from lightning or radio transmitters, seek expert advice. Some of the problems caused by strong sources of electromagnetic interference (EMI) are: • Destruction of the signal drivers and receivers in the switch • Electrical hazards as a result of power surges conducted over the lines into the equipment

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236
- Power Supply in EX2200 Switches
- Power Supply in EX3200 and EX4200 Switches on page 27
- AC Power Supply in EX4500 Switches
- AC Power Supply in an EX8200 Switch
- DC Power Supply in an EX8200 Switch

Environmental Requirements and Specifications for EX Series Switches

The switch must be installed in a rack or cabinet housed in a dry, clean, well-ventilated, and temperature-controlled environment.

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Ensure that these environmental guidelines are followed:

- The site must be as dust-free as possible, because dust can clog air intake vents and filters, reducing the efficiency of the switch cooling system.
- Maintain ambient airflow for normal switch operation. If the airflow is blocked or restricted, or if the intake air is too warm, the switch might overheat, leading to the switch temperature monitor shutting down the switch to protect the hardware components.

Table 27 on page 91 provides the required environmental conditions for normal switch operation.

Table 27: EX Series Switch Environmental Tolerances

Description	Tolerance
Altitude	No performance degradation to 10,000 feet (3048 meters)
Relative humidity	Normal operation ensured in relative humidity range of 10% through 85%, noncondensing
Temperature	• EX2200, EX3200, EX4200, and EX4500 switches: Normal operation ensured in temperature range of 32° F through 113° F (0° C through 45° C) • EX8208 and EX8216 switches: Normal operation ensured in temperature range of 32° F through 104° F (0° C through 40° C)
Seismic	Complies with Zone 4 earthquake requirements as per GR-63, Issue 3.

NOTE: Install EX Series switches only in restricted areas, such as dedicated equipment rooms and equipment closets, in accordance with Articles 110–16, 110–17, and 110–18 of the National Electrical Code, ANSI/NFPA 70.

Related Topics

- Clearance Requirements for Airflow and Hardware Maintenance for EX2200 Switches
- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96
- Clearance Requirements for Airflow and Hardware Maintenance for EX4500 Switches
- Clearance Requirements for Airflow and Hardware Maintenance for an EX8208 Switch
- Clearance Requirements for Airflow and Hardware Maintenance for an EX8216 Switch

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CHAPTER 5

Mounting and Clearance Requirements

- Rack Requirements for EX3200 and EX4200 Switches on page 93
- Cabinet Requirements for EX3200 and EX4200 Switches on page 94
- Requirements for Mounting an EX3200 or EX4200 Switch on a Desktop or Wall on page 95
- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96

Rack Requirements for EX3200 and EX4200 Switches

You can mount the switch on two-post racks or four-post racks.

Rack requirements consist of:

- Rack type
- Mounting bracket hole spacing
- Rack size and strength
- Rack connection to the building structure

Table 28 on page 93 provides the rack requirements and specifications for the switch.

Table 28: Rack Requirements and Specifications for the Switch

Rack Requirement	Guidelines
Rack type	Use a two-post rack or a four-post rack. You can mount the switch on any two-post or four-post rack that provides bracket holes or hole patterns spaced at 1 U (1.75 in./4.45 cm) increments and that meets the size and strength requirements to support the weight. A U is the standard rack unit defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org). The rack must meet the strength requirements to support the weight of the chassis.
Mounting bracket hole spacing	The holes in the mounting brackets are spaced at 1 U (1.75 in. or 4.45 cm), so that the switch can be mounted in any rack that provides holes spaced at that distance.

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Table 28: Rack Requirements and Specifications for the Switch *(continued)*

Rack Requirement	Guidelines
Rack size and strength	• Ensure that the rack complies with one of these standards: ◦ A 19-in. rack as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org). • Ensure that the rack rails are spaced widely enough to accommodate the switch chassis' external dimensions . The outer edges of the front-mounting brackets extend the width of the chassis to 19 in. (48.2 cm). • The rack must be strong enough to support the weight of the switch. • Ensure that the spacing of rails and adjacent racks allows for the proper clearance around the switch and rack.
Rack connection to building structure	• Secure the rack to the building structure. • If earthquakes are a possibility in your geographical area, secure the rack to the floor. • Secure the rack to the ceiling brackets as well as wall or floor brackets for maximum stability.

One pair of mounting brackets for mounting the switch on two posts of a rack is supplied with each switch. For mounting the switch on four posts of a rack or cabinet, you can order a four-post rack-mount kit separately.

Related Topics

- Chassis Physical Specifications for EX3200 and EX4200 Switches on page 7
- Rack-Mounting and Cabinet-Mounting Warnings for EX Series Switches on page 221
- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96
- Mounting an EX3200 or EX4200 Switch on Two Posts in a Rack or Cabinet on page 122
- Mounting an EX3200 or EX4200 Switch on Four Posts in a Rack or Cabinet on page 124
- Mounting an EX3200 or EX4200 Switch in a Recessed Position in a Rack or Cabinet on page 128

Cabinet Requirements for EX3200 and EX4200 Switches

You can mount the switch in a cabinet that contains a 19-in. rack.

Cabinet requirements consist of:

- Cabinet size
- Clearance requirements
- Cabinet airflow requirements

Table 29 on page 95 provides the cabinet requirements and specifications for the switch.

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Table 29: Cabinet Requirements and Specifications for the Switch

Cabinet Requirement	Guidelines
Cabinet size	• You can mount the switch in a cabinet that contains a 19-in. rack as defined in *Cabinets, Racks, Panels, and Associated Equipment* (document number EIA-310–D) published by the Electronics Industry Association (http://www.eia.org). NOTE: The rack must meet the strength requirements to support the weight of the switch. • The minimum cabinet size must be able to accommodate the maximum external dimensions of the switch.
Cabinet clearance	• The outer edges of the mounting brackets extend the width of the chassis to 19 in. (48.3 cm). • The minimum total clearance inside the cabinet is 30 in. (76.2 cm) between the inside of the front door and the inside of the rear door.
Cabinet airflow requirements	When you mount the switch in a cabinet, ensure that ventilation through the cabinet is sufficient to prevent overheating. • Ensure adequate cool air supply to dissipate the thermal output of the switch or switches. • Ensure that the cabinet allows the chassis hot exhaust air to exit the cabinet without recirculating into the switch. An open cabinet (without a top or doors) that employs hot air exhaust extraction from the top allows the best airflow through the chassis. If the cabinet contains a top or doors, perforations in these elements assist with removing the hot air exhaust. • Install the switch in the cabinet in a way that maximizes the open space on the side of the chassis that has the hot air exhaust. This maximizes the clearance for critical airflow. • Route and dress all cables to minimize the blockage of airflow to and from the chassis. • Ensure that the spacing of rails and adjacent cabinets allows for the proper clearance around the switch and cabinet. • A cabinet larger than the minimum required provides better airflow and reduces the chance of overheating.

Related Topics

- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96
- Rack Requirements for EX3200 and EX4200 Switches on page 93
- Mounting an EX3200 or EX4200 Switch on Two Posts in a Rack or Cabinet on page 122

Requirements for Mounting an EX3200 or EX4200 Switch on a Desktop or Wall

You can install the switch on a desktop or wall. When choosing a location, allow at least 6 in. (15.2 cm) of clearance between the front and back of the chassis and adjacent equipment or walls.

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Ensure that the wall onto which the switch is installed is stable and securely supported.

If you are mounting the switch in sheetrock (wall board with a gypsum plaster core) or in wall board not backed by wall studs, use hollow wall anchors capable of supporting the combined weight of two fully loaded chassis. Insert the screws into wall studs wherever possible to provide added support for the chassis.

Use the wall-mount kit from Juniper Networks to mount the switch on a wall. The wall-mount kit is not part of the standard package and needs to be ordered separately.

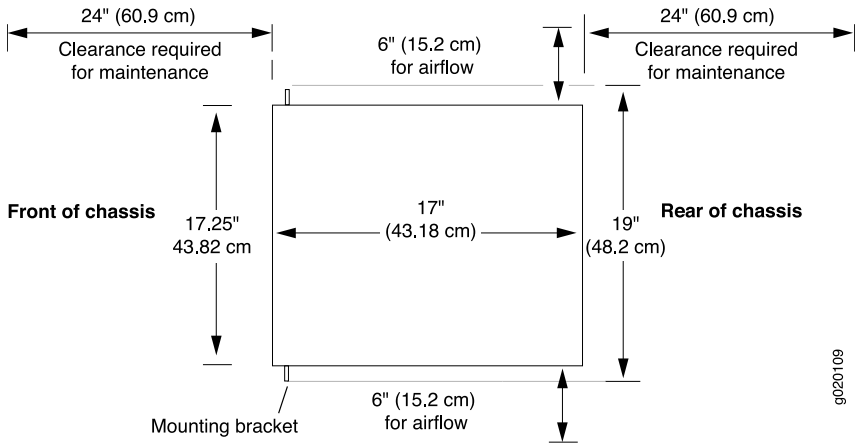
Related Topics

- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96
- Wall-Mounting Warning for EX3200 and EX4200 Switches on page 225
- Mounting an EX3200 or EX4200 Switch on a Desk or Other Level Surface on page 121
- Mounting an EX3200 or EX4200 Switch on a Wall on page 128

Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches

When planning the site for installing an EX3200 or EX4200 switch, you must allow sufficient clearance around the installed switch (see Figure 27 on page 96).

Figure 27: Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches



- Allow at least 6 in. (15.2 cm) of clearance on the side between devices that have fans or blowers installed. Allow 2.8 in. (7 cm) between the side of the chassis and any non-heat-producing surface such as a wall. For the cooling system to function properly, the airflow around the chassis must be unrestricted. Figure 28 on page 97 shows the airflow through the EX3200 switch chassis and Figure 29 on page 98 shows the airflow through the EX4200 switch chassis.
- If you are mounting an EX3200 or EX4200 switch on a rack or cabinet with other equipment, or if you are placing it on the desktop or floor near other equipment, ensure

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that the exhaust from other equipment does not blow into the intake vents of the chassis.

- Leave at least 24 in. (61 cm) both in front of and behind the EX3200 or EX4200 switch. For service personnel to remove and install hardware components, you must leave adequate space at the front and back of the switch. NEBS GR-63 recommends that you allow at least 30 in. (76.2 cm) in front of the rack or cabinet and 24 in. (61 cm) behind the rack or cabinet.

Figure 28: Airflow Through the EX3200 Switch Chassis

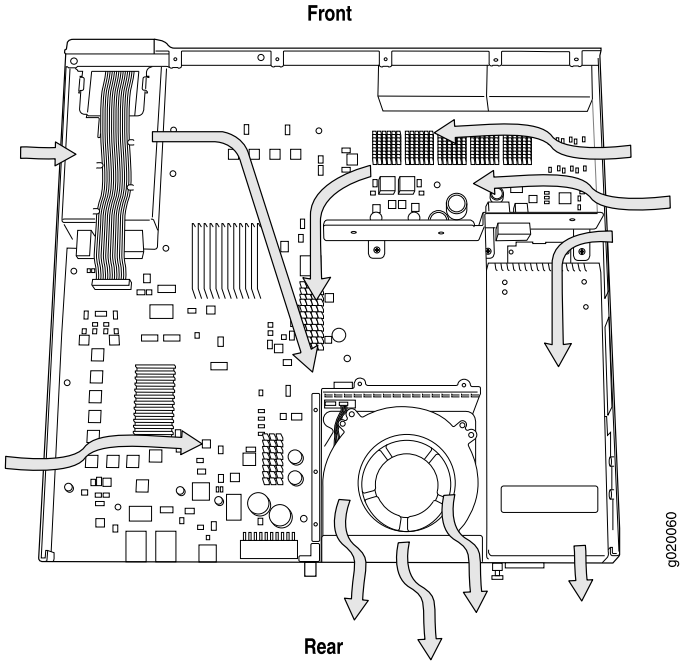
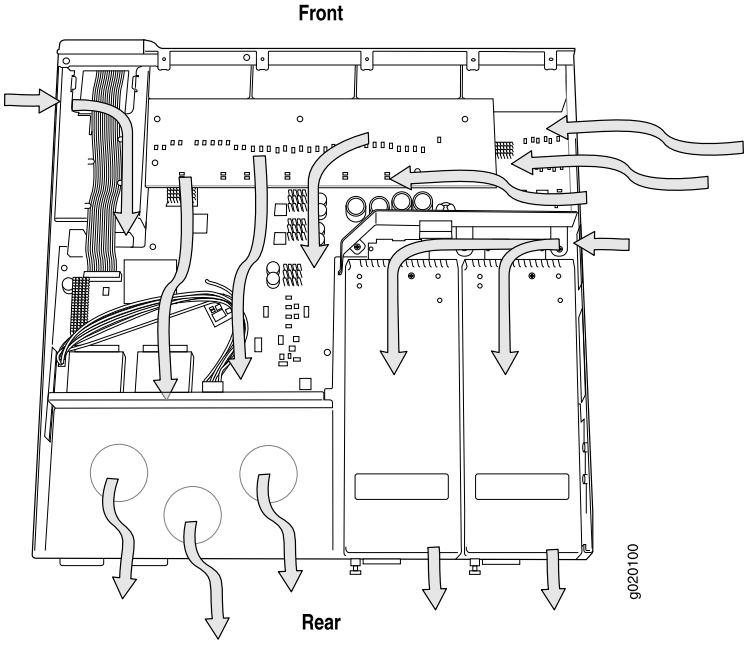


Figure 29: Airflow Through the EX4200 Switch Chassis



Related Topics

- Rack Requirements for EX3200 and EX4200 Switches on page 93
- Cabinet Requirements for EX3200 and EX4200 Switches on page 94
- General Site Guidelines for EX Series Switches on page 89
- Rack-Mounting and Cabinet-Mounting Warnings for EX Series Switches on page 221
- Cooling System and Airflow in an EX3200 Switch on page 31
- Cooling System and Airflow in an EX4200 Switch on page 33

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CHAPTER 6

Cable Specifications

- Network Cable Specifications for EX3200 and EX4200 Switches on page 99

Network Cable Specifications for EX3200 and EX4200 Switches

EX3200 and EX4200 switches have interfaces that use various types of network cables.

For instructions on connecting an EX3200 or EX4200 switch to a network for out-of-band management using an Ethernet cable with an RJ-45 connector, see “Connecting an EX Series Switch to a Network for Out-of-Band Management” on page 152.

For instructions on connecting an EX3200 or EX4200 switch to a management console using an Ethernet cable with an RJ-45 connector, see “Connecting an EX Series Switch to a Management Console” on page 153.

Related Topics

- Management Port Connector Pinout Information for an EX3200 or EX4200 Switch on page 42
- Console Port Connector Pinout Information for an EX Series Switch on page 41
- Rear Panel of an EX3200 Switch on page 8
- Rear Panel of an EX4200 Switch on page 11

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CHAPTER 7

Planning Power Requirements

- Power Specifications for EX3200 and EX4200 Switches on page 101
- AC Power Cord Specifications for EX3200 and EX4200 Switches on page 102

Power Specifications for EX3200 and EX4200 Switches

This topic describes power specifications for power supplies for EX3200 and EX4200 switches.

Table 30 on page 101 provides the AC power supply electrical specifications for EX3200 and EX4200 switches.

Table 31 on page 101 provides the DC power supply electrical specifications for EX3200 and EX4200 switches.

Table 30: AC Power Supply Electrical Specifications for EX3200 and EX4200 Switches

Item	Specification
AC input voltage	100 through 240 VAC
AC input line frequency	50 through 60 Hz
AC system current rating	• 4 A (for switches with 8 ports equipped for Power over Ethernet (PoE) or the switch with 24 100Base-FX/1000Base-SX SFP ports) • 7 A (for switches with 24 ports equipped for PoE) • 12 A (for switches with 48 ports equipped for PoE)

Table 31: DC Power Supply Electrical Specifications for EX3200 and EX4200 Switches

Item	Specification
DC input voltage	36 through 72 VDC
DC input current	7 A maximum
Power supply output	190 W
Output holdup time	1 ms minimum

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NOTE: The DC power supply in EX3200 and EX4200 switches does not support Power over Ethernet (PoE); you can use either an external power injector or an AC power supply to supply power to PoE devices that you connect to the switch.

NOTE: For DC power supplies, we recommend that you provide at least 7.5 A @ 48 VDC and use a facility circuit breaker rated for 10 A minimum. Doing so enables you to operate the switch in any configuration without upgrading the power infrastructure, and allows the switch to function at full capacity using multiple power supplies.

Related Topics

- AC Power Cord Specifications for EX3200 and EX4200 Switches on page 102
- Power Supply in EX3200 and EX4200 Switches on page 27
- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235

AC Power Cord Specifications for EX3200 and EX4200 Switches

Detachable AC power cords are supplied with the switch. The coupler is type C13 as described by International Electrotechnical Commission (IEC) standard 60320. The plug at the male end of the power cord fits into the power source outlet that is standard for your geographical location.

CAUTION: The AC power cord for the switches is intended for use with that switch only and not for any other use.

NOTE: In North America, AC power cords must not exceed 4.5 meters (approximately 14.75 feet) in length, to comply with National Electrical Code (NEC) Sections 400-8 (NFPA 75, 5-2.2) and 210-52 and Canadian Electrical Code (CEC) Section 4-010(3). The cords supplied with the switch are in compliance.

Table 32 on page 102 lists AC power cord specifications provided for each country or region.

Table 32: AC Power Cord Specifications

Country/Region	Electrical Specifications	Plug Standards
Australia	250 VAC, 10 A, 50 Hz	AS/NZ 3112
China	250 VAC, 10 A, 50 Hz	GB2099 and GB1002
Europe (except Italy, Switzerland, and United Kingdom)	250 VAC, 10 A, 50 Hz	CEE (7) VII

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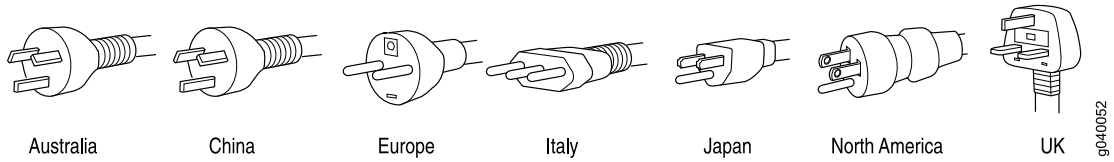
Table 32: AC Power Cord Specifications *(continued)*

Country/Region	Electrical Specifications	Plug Standards
Italy	250 VAC, 10 A, 50 Hz	CEI 23-16
Japan	125 VAC, 12 A, 50 Hz or 60 Hz	JIS C8303
North America	125 VAC, 13 A, 60 Hz	NEMA 5-15
Switzerland	250 VAC, 10 A, 50 Hz	SEV 1011 SEV 6534/2
United Kingdom	250 VAC, 10 A, 50 Hz	BS 1363/A

Figure 30 on page 103 illustrates the plug on the power cord for each country or region listed in Table 32 on page 102.

Figure 30: AC Plug Types



Related Topics

- Power Supply in EX3200 and EX4200 Switches on page 27
- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236

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CHAPTER 8

Planning the Virtual Chassis

- Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch on page 105
- Planning the Virtual Chassis on page 106
- Virtual Chassis Cabling Configuration Examples for EX4200 Switches on page 107
- Adding a New Switch to an Existing Virtual Chassis Configuration (CLI Procedure) on page 109

Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch

Virtual Chassis is a feature in Juniper Networks EX4200 Ethernet Switches that allows you to interconnect two or more EX4200 switches, enabling them to operate as a unified single high bandwidth switch. You can interconnect a maximum of 10 EX4200 switches through the dedicated 64-Gbps Virtual Chassis ports (VCPs) or the uplink module ports configured as VCPs to form a Virtual Chassis. All EX4200 switch models support Virtual Chassis, and you can interconnect different models, offering a range of port configurations, within the same Virtual Chassis.

The Virtual Chassis configuration includes designation of a master switch and a backup switch, with all other switches in the configuration designated as "line card" role switches. Virtual Chassis operation is managed through the master switch. Each switch in the Virtual Chassis is assigned a unique identifier that is displayed on the switch LCD.

Related Topics

- Understanding Virtual Chassis Components
- Planning the Virtual Chassis on page 106
- Virtual Chassis Ports Connector Pinout Information for EX4200 Switches on page 81
- Virtual Chassis Cabling Configuration Examples for EX4200 Switches on page 107

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Planning the Virtual Chassis

Before installing EX4200 switches in a Virtual Chassis configuration, you must consider the following factors:

- The number of switches in the Virtual Chassis and location—You can interconnect two to ten EX4200 switches to form a Virtual Chassis. You can stack the switches in a single rack or install them on multiple racks. For information on the size and strength of racks, see “Rack Requirements for EX3200 and EX4200 Switches” on page 93. See “Chassis Physical Specifications for EX3200 and EX4200 Switches” on page 7 for the dimensions and weights of the switch models.
- Cabling requirements for Virtual Chassis—You can interconnect the EX4200 switches in a Virtual Chassis configuration through Virtual Chassis ports (VCPs) using the 0.5 meter long VCP cable supplied in the package. Depending on the Virtual Chassis configurations you have, you might need cables of different lengths. If you need longer cables, you can purchase them separately. The maximum length allowed for a Virtual Chassis cable is 5 meters. To connect switches that are installed farther apart, you must configure the uplink module ports as Virtual Chassis ports and use them to interconnect the switches.

NOTE: If you order Virtual Chassis cables separately, you should reuse the locking covers provided with the original cable or order Virtual Chassis cable locking covers also separately.

- Clearance on the rear of the switch—You must have access to the rear of the switch if you plan to interconnect switches to form a Virtual Chassis.
- Power supply—You must plan the installation site to meet the power requirements of the EX Series switches in a Virtual Chassis. The input power requirements vary depending on the number of Power over Ethernet (PoE) ports in a switch. See “Power Supply in EX3200 and EX4200 Switches” on page 27 for the power requirements for the various configurations of PoE ports in EX4200 switches.

Related Topics

- Understanding Virtual Chassis Components
- Virtual Chassis Ports Connector Pinout Information for EX4200 Switches on page 81
- Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch on page 105
- Virtual Chassis Cabling Configuration Examples for EX4200 Switches on page 107
- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96

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Virtual Chassis Cabling Configuration Examples for EX4200 Switches

You can install EX4200 switches in a single rack or multiple racks, or in different wiring closets, and interconnect them to form a Virtual Chassis. There are two dedicated Virtual Chassis ports (VCPs) on the rear panel of the EX4200 switch that are used exclusively to interconnect EX4200 switches as a Virtual Chassis. The physical location of the switches in a Virtual Chassis is restricted only by the maximum length supported for cables to connect the VCPs. The maximum cable length for interconnecting the dedicated VCPs is 5 meters. If you want to interconnect EX4200 switches that are located beyond the reach of the dedicated VCP cables, you can install the XFP uplink module, the SFP uplink module, or the SFP+ uplink module and set the uplink module ports as VCP interfaces. See Setting an Uplink Module Port as a Virtual Chassis Port (CLI Procedure).

NOTE: The interfaces for the two dedicated VCPs are operational by default. However, if you are using the uplink module ports as VCPs, you must explicitly set the uplink module ports to function as VCPs.

The following illustrations describe various Virtual Chassis cabling configuration examples.

NOTE: For increased availability and redundancy, we recommend that you always configure your Virtual Chassis in a ring topology.

Figure 31 on page 107 and Figure 32 on page 108 show five EX4200 switches stacked vertically in a rack and interconnected in a ring topology using four short Virtual Chassis cables and one long Virtual Chassis cable.

Figure 31: EX4200 Switches Mounted on a Single Rack and Connected in a Ring Topology Using Short and Long Cables: Option 1

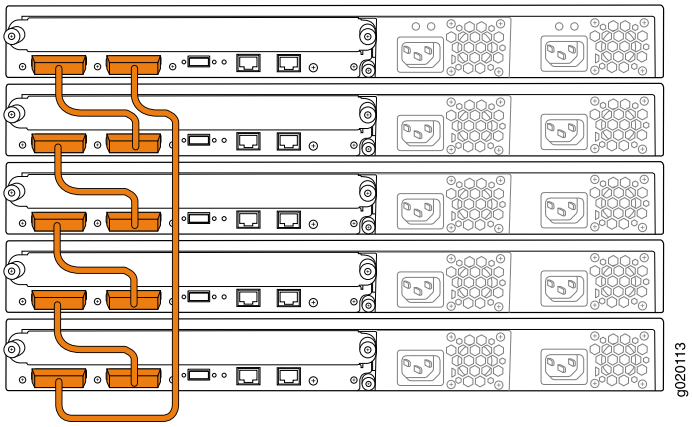

Figure 32: EX4200 Switches Mounted on a Single Rack and Connected in a Ring Topology Using Short and Long Cables: Option 2

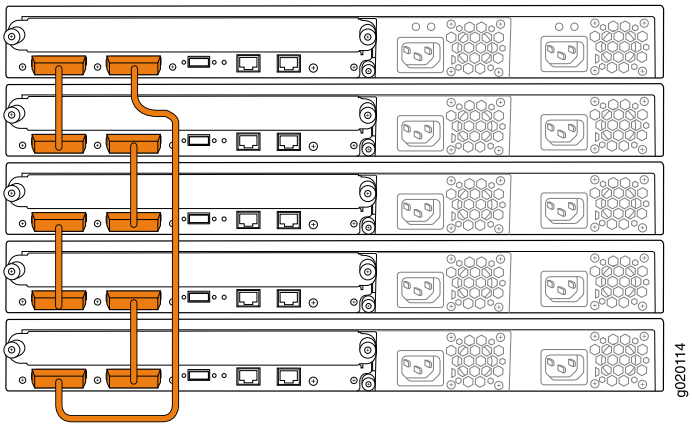

Figure 33 on page 108 shows five EX4200 switches stacked vertically in a rack and interconnected in a ring topology using short-length and medium-length Virtual Chassis cables.

Figure 33: EX4200 Switches Mounted on a Single Rack and Connected in a Ring Topology Using Short and Medium Cables

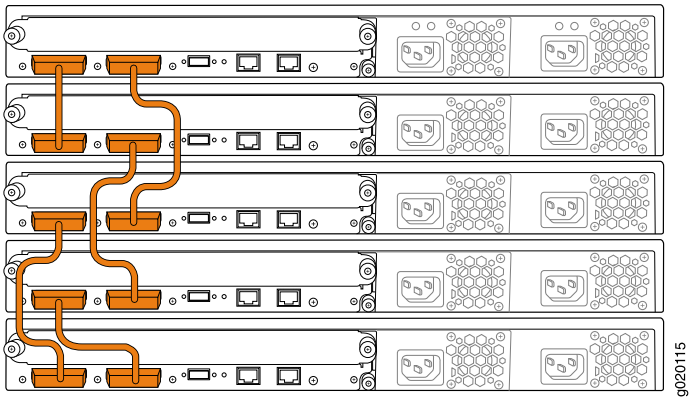

Figure 34 on page 108 and Figure 35 on page 109 show five EX4200 switches mounted on the top rows of adjacent racks and interconnected in a ring topology using medium-length and long-length Virtual Chassis cables.

Figure 34: EX4200 Switches Mounted on Adjacent Racks and Connected in a Ring Topology Using Medium and Long Cables: Option 1

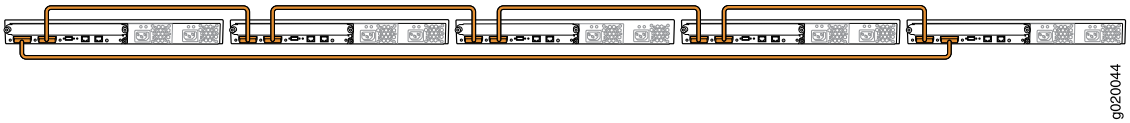

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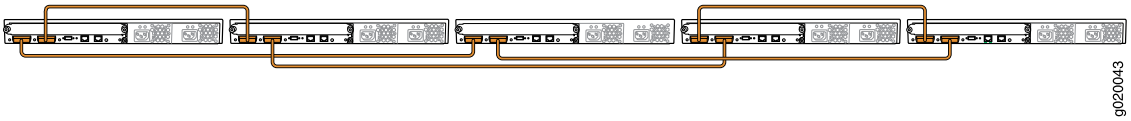
Figure 35: EX4200 Switches Mounted on Adjacent Racks and Connected in a Ring Topology Using Medium and Long Cables: Option 2



Related Topics

- Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch on page 105
- Understanding Virtual Chassis Components
- Planning the Virtual Chassis on page 106
- Virtual Chassis Ports Connector Pinout Information for EX4200 Switches on page 81
- Example: Configuring a Virtual Chassis Interconnected Across Multiple Wiring Closets

Adding a New Switch to an Existing Virtual Chassis Configuration (CLI Procedure)

You can add one or more EX4200 switches to an existing Virtual Chassis configuration. Up to ten EX4200 switches can be included within a Virtual Chassis configuration. You can add the new switches to either type—nonprovisioned or preprovisioned—of Virtual Chassis configuration. See Configuring a Virtual Chassis (CLI Procedure) for descriptions of these types.

To add a switch to an existing Virtual Chassis configuration, use the procedure that matches what you need to accomplish:

- Adding a New Switch to an Existing Virtual Chassis Configuration Within the Same Wiring Closet on page 109
- Adding a New Switch from a Different Wiring Closet to an Existing Virtual Chassis Configuration on page 110
- Adding a New Switch to an Existing Preprovisioned Virtual Chassis Configuration Using Autoprovisioning on page 112

Adding a New Switch to an Existing Virtual Chassis Configuration Within the Same Wiring Closet

Before you begin, be sure you have:

- Mounted the new switch in a rack.
- Confirmed that the new switch is powered off.
- If you are expanding a preprovisioned configuration, made a note of the serial number (on the back of the switch). You will need to edit the Virtual Chassis configuration to include the serial number of the new member switch.
- If you are expanding a preprovisioned configuration, edited the existing Virtual Chassis configuration to include the serial number of the new member switch. You can specify the role of the new member switch when you add its serial number in the Virtual Chassis configuration file. The parameters specified in the master Virtual Chassis configuration

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file are applied after the new member switch has been interconnected to an existing member switch.

NOTE: After you have created a preprovisioned Virtual Chassis configuration, you can use the autoprovisioning feature to add member switches to that configuration.

To add a new member switch to an existing Virtual Chassis configuration within the same wiring closet:

1. If the new member switch has been previously configured, revert that switch's configuration to the factory defaults. See Reverting to the Default Factory Configuration for the EX Series Switch.
2. Interconnect the unpowered new switch to at least one member of the existing Virtual Chassis configuration using the dedicated Virtual Chassis ports (VCPs).
3. Power on the new switch.
4. Confirm that the new member switch is now included within the Virtual Chassis configuration by checking the front-panel display for the member ID. It should display a member ID that is higher than 0 (1 through 9), because there is already at least one member of the Virtual Chassis configuration.

NOTE: If you are using a preprovisioned configuration, the member ID is automatically assigned to the member's serial number in the configuration file.

Adding a New Switch from a Different Wiring Closet to an Existing Virtual Chassis Configuration

To add a new switch from a different wiring closet to an existing Virtual Chassis configuration, you must use a long cable to connect the new member switch across wiring closets. You can use a port on an SFP, SFP+ or XFP uplink module, or an SFP network port on an EX4200-24F switch, and a fiber-optic cable for this purpose.

Before you begin, be sure you have:

- Installed the uplink modules needed for the Virtual Chassis configuration.
- Mounted the new switch in a rack.
- If the new member switch has been previously configured, reverted its configuration to the factory defaults. See Reverting to the Default Factory Configuration for the EX Series Switch.
- Powered on the new member switch as a standalone switch and configured its uplink module ports as VCPs. Otherwise, it cannot be recognized as a member switch by the master.
- If you are expanding a preprovisioned configuration, made a note of the serial number (on the back of the switch). You will need to edit the Virtual Chassis configuration to include the serial number of the new member switch.

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- If you are expanding a preprovisioned configuration, edited the existing Virtual Chassis configuration to include the serial number of the new member switch. You can specify the role of the new member switch when you add its serial number in the Virtual Chassis configuration file. The parameters specified in the master Virtual Chassis configuration file are applied after the new member switch has been interconnected with its uplink VCP to an existing member switch.
- Confirmed that the new, currently standalone switch is powered off.
- Prepared an existing member switch for interconnecting with the new switch through an uplink module port by configuring an uplink module port as a VCP on the existing member switch.

NOTE: After you have created a preprovisioned Virtual Chassis configuration, you can use the autoprovisioning feature to add member switches to that configuration.

To add a new member switch that is going to be interconnected with the existing Virtual Chassis configuration across wiring closets:

1. Power on the new switch.
2. Connect a laptop or terminal to the console port of the switch, or use EZSetup on the standalone switch to specify temporary identification parameters. (When you interconnect the new member switch with the existing Virtual Chassis configuration, the master will overwrite and disable any specified parameters that conflict with the Virtual Chassis parameters or assigned member configuration.)
3. Use the CLI or the J-Web interface to set the uplink module ports as VCPs.

NOTE: If you are using a nonprovisioned configuration, you might configure the new member switch with a mastership priority value that is less than that of the existing member switches. Doing so ensures that the new member switch will function in a linecard role when it is included within the Virtual Chassis configuration.

4. Power off the new switch.
5. Interconnect the new member switch to at least one member of the existing Virtual Chassis configuration using the uplink module ports on each of the switches that have been configured as VCPs.
6. Power on the new member switch.
7. Confirm that the new member switch is now included within the Virtual Chassis configuration by checking the front-panel display for the member ID. It should display a member ID that is higher than 0 (1 through 9), because there is already at least one member of the Virtual Chassis configuration.

NOTE: If you are using a preprovisioned configuration, the member ID is automatically assigned to the member's serial number in the configuration file.

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Adding a New Switch to an Existing Preprovisioned Virtual Chassis Configuration Using Autoprovisioning

Before you begin, be sure you have:

- Installed the uplink modules needed for the Virtual Chassis configuration.
- Mounted the new switch in a rack.
- Ensured that the preprovisioned Virtual Chassis configuration has an active master. For more information, see Example: Configuring a Virtual Chassis Using a Preprovisioned Configuration File.
- On the master, configured the Link Level Discovery Protocol (LLDP) on the uplink module ports that will be used as VCPs. LLDP is configured by default but might have been disabled. To configure LLDP, see Configuring LLDP (CLI Procedure) or Configuring LLDP (J-Web Procedure).
- Ensured that the new member switch has the factory-default configuration. If the new member switch has been previously configured, revert its configuration to the factory defaults. See Reverting to the Default Factory Configuration for the EX Series Switch.
- Made a note of the serial number (on the back of the switch). You will need to edit the Virtual Chassis configuration to include the serial number of the new member switch.
- Edited the existing Virtual Chassis preprovisioned configuration to include the serial number of the new member switch. You can specify the role of the new member switch when you add its serial number to the Virtual Chassis configuration file. The parameters specified in the master Virtual Chassis configuration file are applied to the new member switch after it has been interconnected through its uplink VCP to an existing member switch.
- Prepared an existing member switch to interconnect with the new switch through an uplink module port by configuring an uplink module port as a VCP on the existing member switch.
- Ensured that the operational modes of the uplink modules on the existing member switch and the new member switch match.
- Confirmed that the new member switch is powered off.
- Interconnected the existing switch with the new switch using the appropriate cable.

If these conditions are not met, autoprovisioning will not work and you will need to manually configure uplink module ports on the switch to be added to the configuration to be VCPs. For more information, see Setting an Uplink Module Port as a Virtual Chassis Port (CLI Procedure).

To add a switch to an existing preprovisioned Virtual Chassis configuration using the autoprovisioning feature:

1. Power on the new member switch.
2. Confirm that the new member switch is now included in the Virtual Chassis configuration by checking the front-panel display for the member ID. It should display

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a member ID in the range from 0 through 9 because there was already at least one member of the Virtual Chassis configuration. The member ID is automatically assigned to the new member switch's serial number in the configuration file.

Related Topics

- Example: Expanding a Virtual Chassis Configuration in a Single Wiring Closet
- Example: Setting Up a Multimember Virtual Chassis Access Switch with a Default Configuration
- Example: Configuring a Virtual Chassis Interconnected Across Multiple Wiring Closets
- Example: Configuring a Virtual Chassis Using a Preprovisioned Configuration File
- Example: Configuring Automatic Software Update on Virtual Chassis Member Switches
- Monitoring Virtual Chassis Configuration Status and Statistics
- Replacing a Member Switch of a Virtual Chassis Configuration (CLI Procedure) on page 183
- Reverting to the Default Factory Configuration for the EX Series Switch

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PART 3

Installing and Connecting the Switch and Switch Components

- Installing the Switch on page 117
- Installing Switch Components on page 131
- Connecting the Switch on page 141
- Performing Initial Configuration on page 161

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CHAPTER 9

Installing the Switch

- Installing and Connecting an EX3200 or EX4200 Switch on page 117
- Unpacking an EX3200 or EX4200 Switch on page 118
- Mounting an EX3200 or EX4200 Switch on page 120
- Mounting an EX3200 or EX4200 Switch on a Desk or Other Level Surface on page 121
- Mounting an EX3200 or EX4200 Switch on Two Posts in a Rack or Cabinet on page 122
- Mounting an EX3200 or EX4200 Switch on Four Posts in a Rack or Cabinet on page 124
- Mounting an EX3200 or EX4200 Switch in a Recessed Position in a Rack or Cabinet on page 128
- Mounting an EX3200 or EX4200 Switch on a Wall on page 128

Installing and Connecting an EX3200 or EX4200 Switch

The EX3200 and EX4200 switch chassis is a rigid sheet-metal structure that houses the hardware components.

To install and connect an EX3200 or EX4200 switch:

1. Follow instructions in “Unpacking an EX3200 or EX4200 Switch” on page 118.
2. Mount the switch by following instructions appropriate for your site:
   - “Mounting an EX3200 or EX4200 Switch on Two Posts in a Rack or Cabinet” on page 122 (using the mounting brackets provided)
   - “Mounting an EX3200 or EX4200 Switch on Four Posts in a Rack or Cabinet” on page 124 (using the separately orderable four-post rack-mount kit)
   - “Mounting an EX3200 or EX4200 Switch in a Recessed Position in a Rack or Cabinet” on page 128 (using the 2-in.-recess front brackets from the separately orderable four-post rack-mount kit)
   - “Mounting an EX3200 or EX4200 Switch on a Desk or Other Level Surface” on page 121 (using the rubber feet provided)
   - “Mounting an EX3200 or EX4200 Switch on a Wall” on page 128 (using the separately orderable wall-mount kit)

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3. Follow instructions in "Connecting Earth Ground to an EX Series Switch" on page 141.
4. Follow instructions for connecting power as appropriate for your site:
   - Connecting AC Power to an EX3200 or EX4200 Switch on page 147
   - Connecting DC Power to an EX3200 or EX4200 Switch on page 149
5. Perform initial configuration of the switch by following instructions in "Connecting and Configuring an EX Series Switch (CLI Procedure)" on page 165 or "Connecting and Configuring an EX Series Switch (J-Web Procedure)" on page 167.
6. Set the switch's management options by following the appropriate instructions:
   - Connecting an EX Series Switch to a Network for Out-of-Band Management on page 152
   - Connecting an EX Series Switch to a Management Console on page 153

Related Topics

- Rack Requirements for EX3200 and EX4200 Switches on page 93
- Cabinet Requirements for EX3200 and EX4200 Switches on page 94
- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96

Unpacking an EX3200 or EX4200 Switch

The EX3200 and EX4200 switch chassis is a rigid sheet-metal structure that houses the hardware components. EX3200 and EX4200 switches are shipped in a cardboard carton, secured with foam packing material. The carton also contains an accessory box and quick start instructions.

CAUTION: EX3200 and EX4200 switches are maximally protected inside the shipping carton. Do not unpack the switches until you are ready to begin installation.

To unpack an EX3200 or EX4200 switch (see Figure 36 on page 119):

1. Move the shipping carton to a staging area as close to the installation site as possible, but where you have enough room to remove the system components.
2. Position the carton so that the arrows are pointing up.
3. Open the top flaps on the shipping carton.
4. Remove the accessory box and verify the contents against the parts inventory on the label attached to the carton.
5. Pull out the packing material holding the switch in place.

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6. Verify the chassis components received against the packing list included with the switch. An inventory of parts provided with an EX3200 or EX4200 switch is provided in Table 33 on page 119.
7. Save the shipping carton and packing materials in case you need to move or ship the switch later.

Figure 36: Unpacking an EX3200 or EX4200 Switch

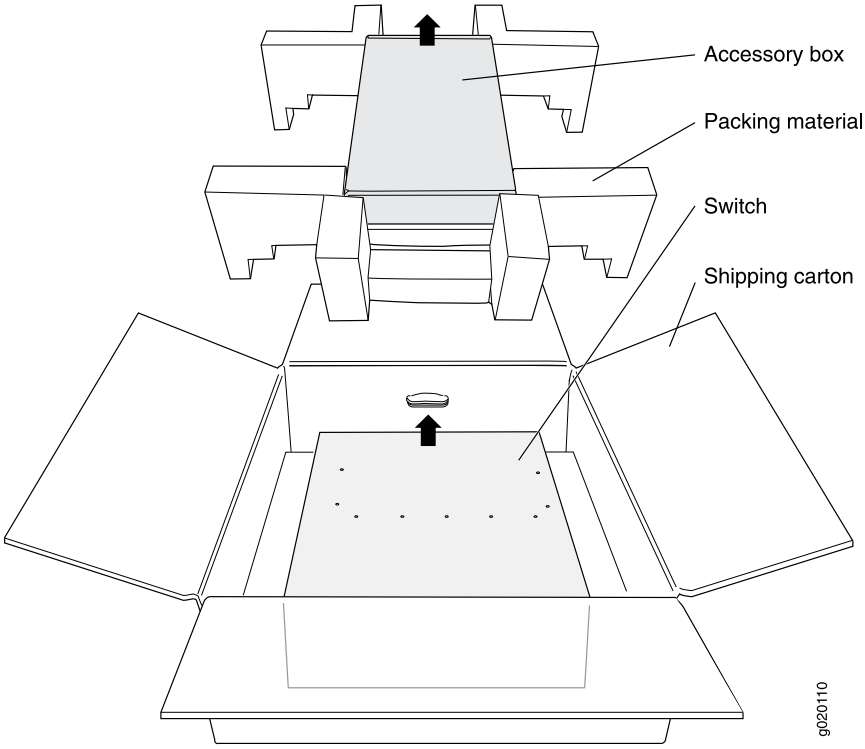

Table 33: Inventory of Components Provided with an EX3200 or EX4200 Switch

Component	Quantity
Switch	1
Fan tray (preinstalled)	1
Power supply (preinstalled if your system order includes a 320 W AC power supply; not preinstalled if your system order includes a 600 W AC power supply, a 930 W AC power supply, or a 190 W DC power supply)	1
Power cord retainer	1
Mounting brackets	2
Mounting screws	8
Rubber feet	4

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Table 33: Inventory of Components Provided with an EX3200 or EX4200 Switch *(continued)*

Component	Quantity
RJ-45 cable and RJ-45 to DB-9 serial port adapter	1
Virtual Chassis cable (for an EX4200 switch)	1
Virtual Chassis cable connector retainers (for an EX4200 switch)	2
Dust covers for ports (for an EX4200-24F switch)	24

Related Topics

- Mounting an EX3200 or EX4200 Switch on page 120
- Installing and Connecting an EX3200 or EX4200 Switch on page 117
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167

Mounting an EX3200 or EX4200 Switch

You can mount an EX3200 or EX4200 switch:

- On two posts in a 19-in. rack or cabinet by using the mounting brackets provided with the switch.
- On four posts in a 19-in. rack or cabinet by using the separately orderable four-post rack-mount kit.
- In a position recessed 2 in. from the front of a 19-in. rack or cabinet by using the 2-in.-recess front brackets in the separately orderable four-post rack-mount kit. You can mount the switch in this recessed position on two-post or four-post racks and cabinets.
- On a desk or other level surface by using rubber feet. The switch is shipped with four rubber feet to be used to stabilize the chassis on a desk or other level surface.
- On a wall by using the separately orderable wall-mount kit.

The holes in the mounting brackets are placed at 1 U (1.75 in. or 4.45 cm.) apart so that the switch can be mounted in any rack or cabinet that provides holes spaced at that distance.

Related Topics

- Mounting an EX3200 or EX4200 Switch on Two Posts in a Rack or Cabinet on page 122
- Mounting an EX3200 or EX4200 Switch on Four Posts in a Rack or Cabinet on page 124
- Mounting an EX3200 or EX4200 Switch in a Recessed Position in a Rack or Cabinet on page 128
- Mounting an EX3200 or EX4200 Switch on a Desk or Other Level Surface on page 121
- Mounting an EX3200 or EX4200 Switch on a Wall on page 128

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- Connecting Earth Ground to an EX Series Switch on page 141

Mounting an EX3200 or EX4200 Switch on a Desk or Other Level Surface

You can mount an EX3200 or EX4200 switch on a desk or other level surface by using the 4 rubber feet that are shipped with the switch. The rubber feet stabilize the chassis.

Before mounting an EX3200 or EX4200 switch on a desk or other level surface:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX3200 and EX4200 Switches" on page 87.
- Place the desk in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read "General Safety Guidelines and Warnings for EX Series Switches" on page 207, with particular attention to "Chassis Lifting Guidelines for EX3200 and EX4200 Switches" on page 220.
- Remove the switch from the shipping carton (see "Unpacking an EX3200 or EX4200 Switch" on page 118).

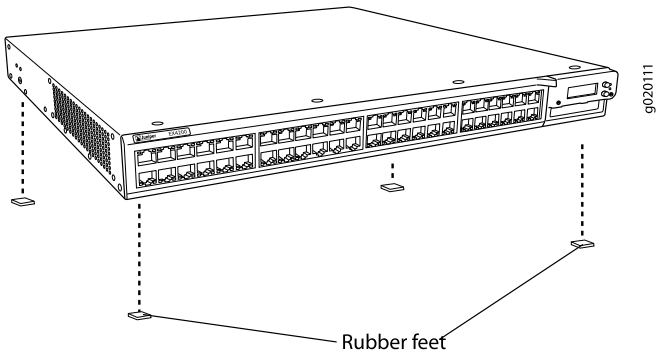
Ensure that you have the following parts and tools available:

- 4 rubber feet to stabilize the chassis on the a desk or other level surface (provided in the accessory box shipped with the switch)
- Dust covers for ports (for EX4200-24F switches only; optional)

To mount the switch on a desk or other level surface:

1. Turn the chassis upside down on the desk or the level surface where you intend to mount the switch.
2. Attach the rubber feet to the bottom of the chassis, as shown in Figure 37 on page 121.
3. Turn the chassis right side up on the desk or the level surface.
4. If it is an EX4200-24F switch, we recommend you insert dust covers in unused SFP ports.

Figure 37: Attaching Rubber Feet to an EX3200 or EX4200 Switch Chassis



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Related Topics

- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167
- Clearance Requirements for Airflow and Hardware Maintenance for EX3200 and EX4200 Switches on page 96

Mounting an EX3200 or EX4200 Switch on Two Posts in a Rack or Cabinet

You can mount an EX3200 or EX4200 switch on two posts of a 19-in. rack or cabinet by using the mounting brackets provided with the switch. (The remainder of this topic uses "rack" to mean "rack or cabinet.")

You can mount the switch on four posts of a four-post rack by using the mounting brackets provided with the separately orderable four-post rack-mount kit. See "Mounting an EX3200 or EX4200 Switch on Four Posts in a Rack or Cabinet" on page 124.

NOTE: If you need to mount the switch in a recessed position on either a two-post rack or a four-post rack, you can use the 2-in.-recess front brackets provided in the separately orderable four-post rack-mount kit.

Before mounting an EX3200 or EX4200 switch on two posts in a rack:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX3200 and EX4200 Switches" on page 87.
- Place the rack in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read "General Safety Guidelines and Warnings for EX Series Switches" on page 207, with particular attention to "Chassis Lifting Guidelines for EX3200 and EX4200 Switches" on page 220.
- Remove the switch from the shipping carton (see "Unpacking an EX3200 or EX4200 Switch" on page 118).

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- 2 mounting brackets and 8 mounting screws (provided in the accessory box shipped with the switch)
- Screws to secure the chassis to the rack (not provided)
- 2-in.-recess front brackets if you will mount the switch in a recessed position (brackets are from the separately orderable four-post rack-mount kit).
- Dust covers for ports (for EX4200-24F switches only; optional)

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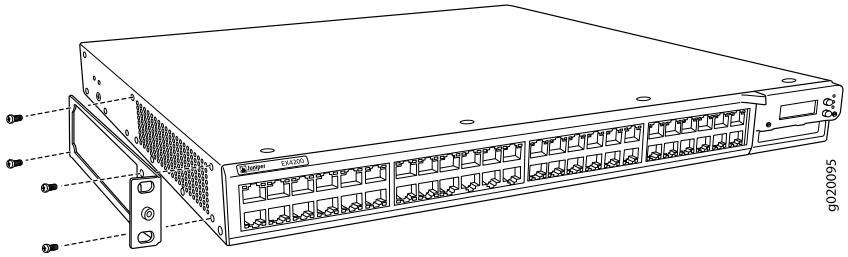
NOTE: One person must be available to lift the switch while another secures the switch to the rack.

CAUTION: If you are mounting multiple switches on a rack, mount a switch in the bottom of the rack first and proceed to mount the rest of the switches from bottom to top.

To mount the switch on two posts in a rack:

1. Place the switch on a flat, stable surface.
2. Align the mounting brackets along the front, rear, or center of the side panels of the switch chassis depending on how you want to mount the switch. For example, if you want to center-mount the switch, align the brackets along the centers of the side panel. See Figure 38 on page 123.

Figure 38: Attaching the Mounting Bracket Along the Front of the Switch



NOTE: If you need to mount the switch in a recessed position, use the 2-in.-recess front mount brackets from the separately orderable four-post rack-mount kit.

3. Align the bottom holes in the mounting brackets with holes on the side panels of the switch chassis.
4. Insert mounting screws into the aligned holes. Tighten the screws.
5. Ensure that the other holes in the mounting brackets are aligned with the holes in the side panels. Insert a screw in each hole and tighten the screws.
6. Have one person grasp both sides of the switch, lift the switch, and position it in the rack, aligning the mounting bracket holes with the threaded holes in the rack or cabinet rail. Align the bottom hole in both the mounting brackets with a hole in each rack rail, making sure the chassis is level. See Figure 39 on page 124.

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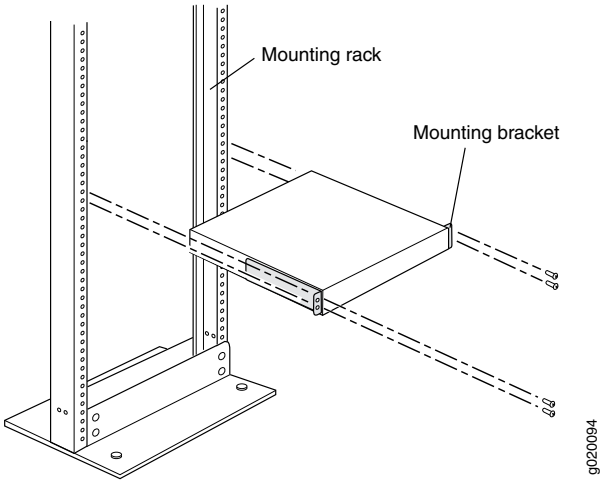
Figure 39: Mounting the Switch on Two Posts in a Rack



7. Have a second person secure the switch to the rack by using the appropriate screws. Tighten the screws.
8. Ensure that the switch chassis is level by verifying that all screws on one side of the rack are aligned with the screws on the other side.
9. If the switch is an EX4200-24F model, we recommend that you insert dust covers in any unused SFP ports.

Related Topics

- Connecting Earth Ground to an EX Series Switch on page 141
- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167
- Mounting an EX3200 or EX4200 Switch in a Recessed Position in a Rack or Cabinet on page 128
- Rack-Mounting and Cabinet-Mounting Warnings for EX Series Switches on page 221

Mounting an EX3200 or EX4200 Switch on Four Posts in a Rack or Cabinet

You can mount an EX3200 or EX4200 switch on four posts of a 19-in. rack or cabinet by using the separately orderable four-post rack-mount kit. (The remainder of this topic uses “rack” to mean “rack or cabinet.”)

You can mount the switch on two posts in either a two-post rack or a four-post rack by using the mounting brackets provided with the switch. See “Mounting an EX3200 or EX4200 Switch on Two Posts in a Rack or Cabinet” on page 122.

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NOTE: If you need to mount the switch in a recessed position on either a two-post rack or a four-post rack, you can use the 2-in.-recess front brackets provided in the separately orderable four-post rack-mount kit.

NOTE: If you are mounting an EX4200 switch on four posts, ensure that the rack is 27.5 in. through 30.5 in. deep if you will mount the switch flush with the rack front and that the rack is 29.5 in. through 32.5 in. deep if you will mount the switch 2 in. recessed from the rack front, thus ensuring that the protective earthing terminal is accessible through the opening in the rear bracket.

Before mounting the switch on four posts in a rack:

- Verify that the site meets the requirements described in “Site Preparation Checklist for EX3200 and EX4200 Switches” on page 87.
- Place the rack in its permanent location, allowing adequate clearance for airflow and maintenance, and secure it to the building structure.
- Read “General Safety Guidelines and Warnings for EX Series Switches” on page 207, with particular attention to “Chassis Lifting Guidelines for EX3200 and EX4200 Switches” on page 220.
- Remove the switch from the shipping carton (see “Unpacking an EX3200 or EX4200 Switch” on page 118).

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- 6 flat-head 4-40 mounting screws (provided with the four-post rack-mount kit)
- 12 flat-head 4x6-mm Phillips mounting screws (provided with the four-post rack-mount kit)
- One pair each of flush or 2-in.-recess front brackets
- One pair of side-rail brackets
- One pair of rear brackets
- Screws to secure the chassis and the rear brackets to the rack (not provided)
- Dust covers for ports (for EX4200-24F switches only; optional)

CAUTION: If you are mounting multiple units on a rack, mount the heaviest unit at the bottom of the rack and mount the other units from the bottom of the rack to the top in decreasing order of the weight of the units.

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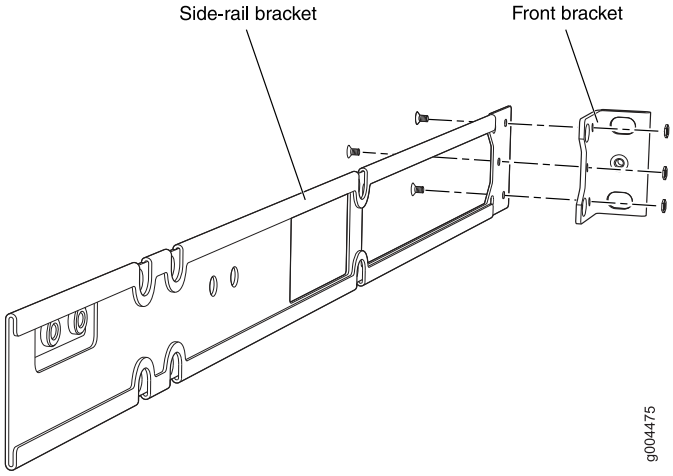
To mount the switch on four posts in a rack:

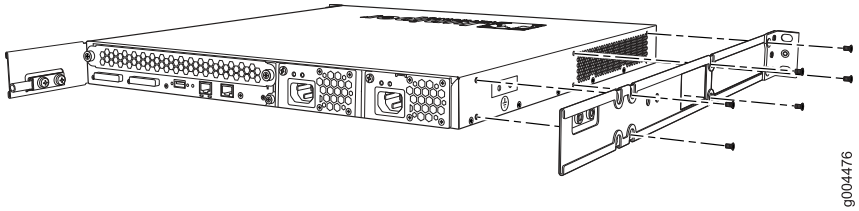
1. Attach the front brackets (either the flush or the 2-in.-recess brackets) to the side-rail brackets using six 4-40 flat-head Phillips mounting screws. See Figure 40 on page 126.

Figure 40: Attaching the Front Bracket to the Side-Rail Bracket



2. Place the switch on a flat, stable surface.
3. Align the side-rail brackets along the side panels of the switch chassis. Align the two holes in the rear of the side-rail brackets with the two holes on the rear of the side panel.
4. Insert 4x6-mm Phillips flat-head mounting screws into the two aligned holes and tighten the screws. Ensure that the remaining four holes in the side-rail brackets are aligned with the four holes in the side panel. See Figure 41 on page 126.

Figure 41: Attaching the Side-Rail Bracket to the Switch Chassis



5. Insert the 4x6-mm Phillips flat-head mounting screws into the remaining four holes in the side-rail brackets and tighten the screws.
6. Have one person grasp both sides of the switch, lift the switch, and position it in the rack, aligning the side-rail bracket holes with the threaded holes in the front post of the rack. Align the bottom hole in both the mounting brackets with a hole in each rack rail, making sure the chassis is level. See Figure 42 on page 127.

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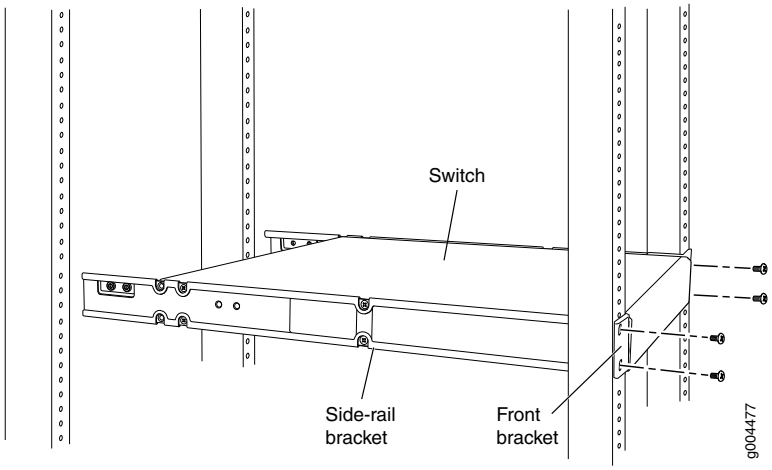
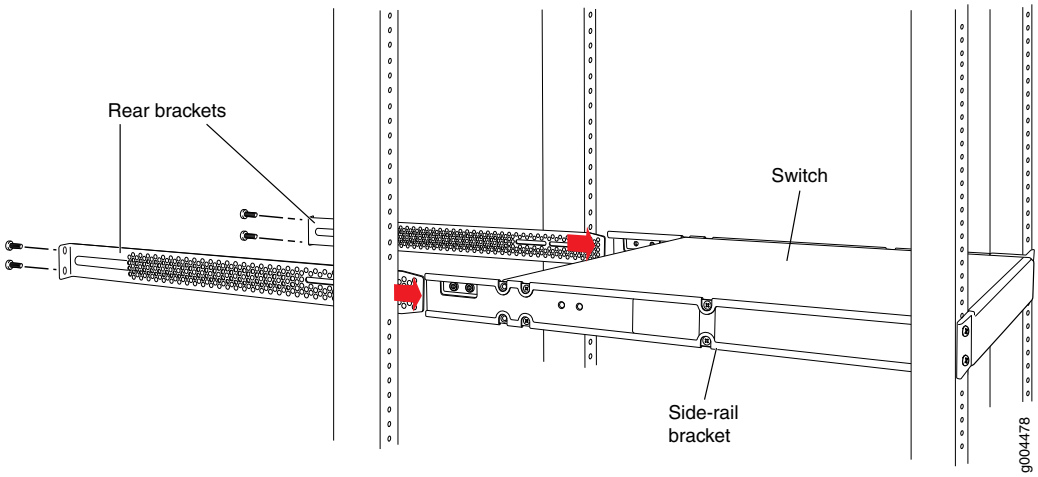
Figure 42: Mounting the Switch to the Front Posts in a Rack



7. Have a second person secure the front of the switch to the rack by using the appropriate screws for your rack.
8. Slide the rear brackets into the side-rail brackets. See Figure 43 on page 127.

Figure 43: Sliding the Rear Brackets to the Rear of a Four-Post Rack



9. Attach the rear brackets to the rear post by using the appropriate screws for your rack. Tighten the screws.
10. Ensure that the switch chassis is level by verifying that all the screws on the front of the rack are aligned with the screws at the back of the rack.
11. If the switch is an EX4200-24F model, we recommend that you insert dust covers in any unused SFP ports.

Related Topics

- Connecting Earth Ground to an EX Series Switch on page 141
- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149

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- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167
- Mounting an EX3200 or EX4200 Switch in a Recessed Position in a Rack or Cabinet on page 128
- Rack-Mounting and Cabinet-Mounting Warnings for EX Series Switches on page 221

Mounting an EX3200 or EX4200 Switch in a Recessed Position in a Rack or Cabinet

You can mount an EX3200 or EX4200 switch in a rack or cabinet such that the switch is recessed inside the rack from the rack front by 2 inches. You can use the 2-in.-recess front brackets provided in the separately orderable four-post rack-mount kit to mount the switch in a recessed position.

Reasons that you might want to mount the switch in a recessed position include:

- You are mounting the switch in a cabinet and the cabinet doors will not close completely unless the switch is recessed.
- The switch you are mounting has an uplink module with transceivers installed in it—the transceivers in the uplink module ports protrude from the front of the switch.

To mount the switch in a recessed position on four posts, follow the instructions in "Mounting an EX3200 or EX4200 Switch on Four Posts in a Rack or Cabinet" on page 124. To mount the switch in a recessed position on two posts, follow the instructions in "Mounting an EX3200 or EX4200 Switch on Two Posts in a Rack or Cabinet" on page 122.

Related Topics

- Connecting Earth Ground to an EX Series Switch on page 141
- Rack-Mounting and Cabinet-Mounting Warnings for EX Series Switches on page 221

Mounting an EX3200 or EX4200 Switch on a Wall

You can mount an EX3200 or EX4200 switch on a wall by using the separately orderable wall-mount kit.

Before mounting an EX3200 or EX4200 switch on a wall:

- Verify that the site meets the requirements described in "Site Preparation Checklist for EX3200 and EX4200 Switches" on page 87.
- Read "General Safety Guidelines and Warnings for EX Series Switches" on page 207, with particular attention to "Chassis Lifting Guidelines for EX3200 and EX4200 Switches" on page 220.
- Remove the switch from the shipping carton (see "Unpacking an EX3200 or EX4200 Switch" on page 118).

Ensure that you have the following parts and tools available:

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- Phillips (+) screwdriver, number 2
- 2 wall-mount brackets (provided with the wall-mount kit)
- 12 wall-mount bracket screws (provided with the wall-mount kit)
- 4 mounting screws (8-32 x 1.25 in. or M4 x 30 mm) (not included)
- Dust covers for ports (for EX4200-24F switches only; optional)
- Hollow wall anchors capable of supporting the combined weight of two fully loaded switches, up to 44 lb (20 kg) (not included)—if you are mounting the switch in sheetrock (wall board with a gypsum plaster core) or in wall board not backed by wall studs

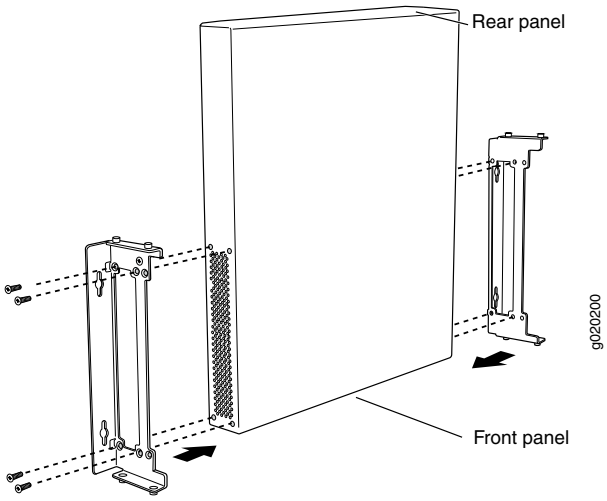
WARNING: When mounted in a vertical position, an EX3200 or EX4200 switch must be oriented with the front panel of the chassis pointing down in order to ensure proper airflow and meet safety requirements in the event of a fire.

NOTE: For easier lifting, install any additional power supplies only after you mount the switch on the wall.

To mount the switch on a wall:

1. Attach the wall-mount brackets to the sides of the chassis using four of the wall-mount bracket screws on each side, as shown in Figure 44 on page 129.

Figure 44: Attaching Wall-Mount Brackets to an EX3200 or EX4200 Switch Chassis



2. If you are mounting two switches together, line the second switch on top of the first and attach it to the mounting brackets using two wall-mount bracket screws on each side (see Figure 45 on page 130).

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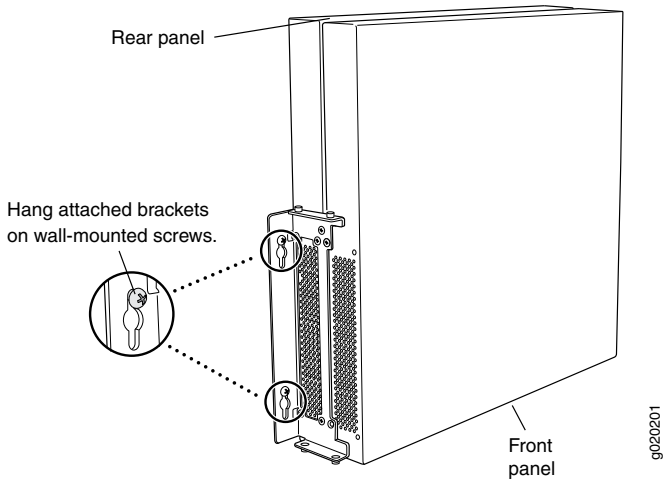
3. Insert the mounting screws in the wall. Insert the top pair of mounting screws 474.35 mm apart, and insert the second pair of mounting screws 151.81 mm directly below the first set.

   If the mounting screws are inserted in wall board with no stud behind it, you must use dry wall anchors rated to support 75 lb (34 kg). Insert the screws into wall studs wherever possible to provide added support for the chassis.

   Screw the screws only part way in, leaving about 1/4 in. (6 mm) distance between the head of the screw and the wall.

4. Grasp each side of the switch or switches, lift the switch or switches, and hang the brackets from the mounting screws as shown in Figure 45 on page 130.

Figure 45: Mounting an EX3200 or EX4200 Switch on a Wall



5. Tighten the mounting screws.

6. If it is an EX4200-24F switch, we recommend you insert dust covers in unused SFP ports.

Related Topics

- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167
- Wall-Mounting Warning for EX3200 and EX4200 Switches on page 225

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CHAPTER 10

Installing Switch Components

- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Installing a Power Supply in an EX3200 or EX4200 Switch on page 132
- Installing a Fan Tray in an EX3200 or EX4200 Switch on page 133
- Installing an Uplink Module in an EX3200 or EX4200 Switch on page 135
- Installing a Transceiver in an EX Series Switch on page 137
- Connecting a Virtual Chassis Cable to an EX4200 Switch on page 139

Installing and Removing EX3200 and EX4200 Switch Hardware Components

The EX3200 and EX4200 switch chassis is a rigid sheet-metal structure that houses the hardware components. The field-replaceable units (FRUs) in EX3200 and EX4200 switches are:

- Power supply
- Fan tray
- Uplink module
- SFP transceiver
- SFP+ transceiver
- XFP transceiver

The power supply, fan tray, uplink module, and transceivers are hot-removable and hot-insertable: You can remove and replace them without powering off the switch or disrupting switch functions.

To install a power supply in an EX3200 or EX4200 switch, follow instructions in "Installing a Power Supply in an EX3200 or EX4200 Switch" on page 132. To remove a power supply from an EX3200 or EX4200 switch, follow instructions in "Removing a Power Supply from an EX3200 or EX4200 Switch" on page 174.

To install a fan tray in an EX3200 or EX4200 switch, follow instructions in "Installing a Fan Tray in an EX3200 or EX4200 Switch" on page 133. To remove a fan tray from an EX3200 or EX4200 switch, follow instructions in "Removing a Fan Tray from an EX3200 or EX4200 Switch" on page 176.

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To install an uplink module in an EX3200 or EX4200 switch, follow instructions in “Installing an Uplink Module in an EX3200 or EX4200 Switch” on page 135. To remove an uplink module from an EX3200 or EX4200 switch, follow instructions in “Removing an Uplink Module from an EX3200 or EX4200 Switch” on page 177.

To install an SFP, SFP+, or XFP transceiver in an EX3200 or EX4200 switch, follow instructions in “Installing a Transceiver in an EX Series Switch” on page 137. To remove an SFP, SFP+, or XFP transceiver from an EX3200 or EX4200 switch, follow instructions in “Removing a Transceiver from an EX Series Switch” on page 179.

Related Topics

- Cooling System and Airflow in an EX3200 Switch on page 31
- Cooling System and Airflow in an EX4200 Switch on page 33
- Power Supply in EX3200 and EX4200 Switches on page 27
- Uplink Modules in EX3200 and EX4200 Switches on page 34
- Optical Interface Support in EX3200 and EX4200 Switches on page 43

Installing a Power Supply in an EX3200 or EX4200 Switch

The power supply in EX3200 and EX4200 switches is a hot-removable and hot-insertable field-replaceable unit (FRU): You can remove and replace it without powering off the switch or disrupting switch functions.

Ensure that you have the following parts and tools available:

- A Phillips (+) screwdriver, number 2

To install a power supply in an EX3200 or EX4200 switch (see Figure 46 on page 133):

1. Taking care not to touch power supply components, pins, leads, or solder connections, remove the power supply from its bag.
2. Loosen the locking lever screw on the left front of the power supply by using the screwdriver.
3. Push down on the locking lever until it is in its lowest position.
4. Using both hands, place the power supply in the power supply slot on the rear panel of the switch and slide it in until it is fully seated.

NOTE: The handle on the 320 W AC power supply is at the bottom of the power supply faceplate, while the handle on the 600 W and the 930 W AC power supplies is at the top of the faceplate. The handle on the 190 W DC power supply runs across the faceplate.

5. Push the locking lever up to its highest position (this action might pull the power supply in).
6. Tighten the locking lever screw by using the screwdriver.

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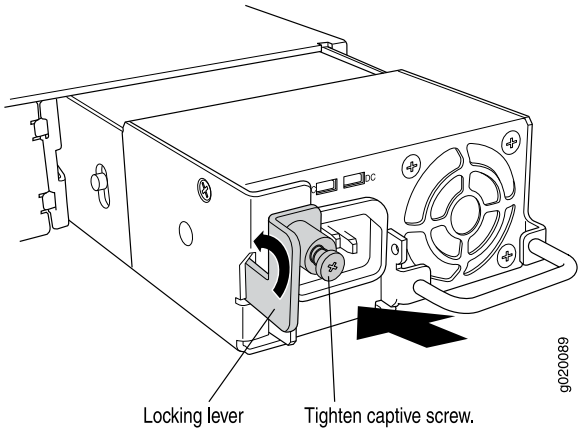
Figure 46: Installing a Power Supply in an EX3200 or EX4200 Switch



NOTE: Each power supply must be connected to a dedicated power source outlet.

NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/csc/management/updateinstallbase.jsp. Failure to do so can result in significant delays if you need replacement parts. This note applies if you change the type of power supply or add a new type of uplink module. It does not apply if you replace these components with the same type of component.

Related Topics

- Removing a Power Supply from an EX3200 or EX4200 Switch on page 174
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Power Supply in EX3200 and EX4200 Switches on page 27
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- AC Power Cord Specifications for EX3200 and EX4200 Switches on page 102
- Rear Panel of an EX3200 Switch on page 8
- Rear Panel of an EX4200 Switch on page 11

Installing a Fan Tray in an EX3200 or EX4200 Switch

EX3200 and EX4200 switches have a single fan tray on the rear panel. The fan tray is a hot-removable and hot-insertable field-replaceable unit (FRU): You can remove and replace it without powering off the switch or disrupting switch functions.

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Ensure that you have the following parts and tools available:

- A Phillips (+) screwdriver, number 2

To install a fan tray in an EX3200 or EX4200 switch chassis (see Figure 47 on page 134 and Figure 48 on page 134):

CAUTION: If you are installing a fan tray in an EX3200 switch, ensure the fan faces upwards. If you are installing a fan tray in an EX4200 switch, ensure the fans face downwards.

1. Remove the fan tray from its bag. Using both hands, align the tray with the fan tray guides on the fan tray slot on the rear panel of the chassis and slide it in until it is fully seated.
2. Tighten the screw or screws on the fan tray by using the screwdriver.

Figure 47: Installing a Fan Tray in an EX3200 Switch

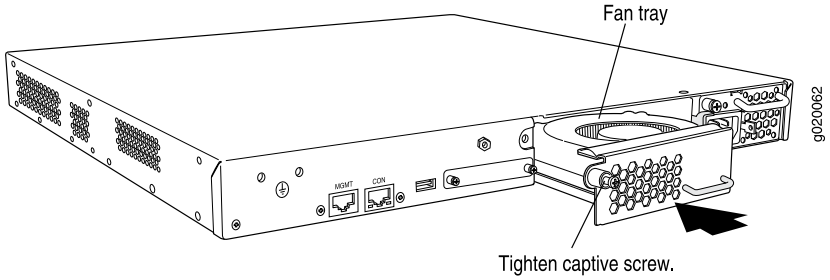
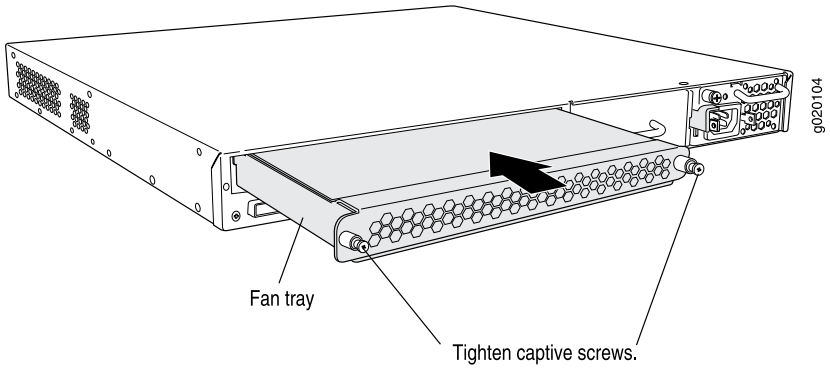


Figure 48: Installing a Fan Tray in an EX4200 Switch



Related Topics

- Removing a Fan Tray from an EX3200 or EX4200 Switch on page 176
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Cooling System and Airflow in an EX3200 Switch on page 31
- Cooling System and Airflow in an EX4200 Switch on page 33
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18

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- Rear Panel of an EX3200 Switch on page 8
- Rear Panel of an EX4200 Switch on page 11

Installing an Uplink Module in an EX3200 or EX4200 Switch

If your EX3200 or EX4200 switch includes an optional uplink module, you install it in the switch's front panel. The different types of uplink modules are described in “Uplink Modules in EX3200 and EX4200 Switches” on page 34.

The uplink module in EX3200 and EX4200 switches is a hot-removable and hot-insertable unit (FRU): You can remove and replace it without powering off the switch or disrupting switch functions.

NOTE: If you have set an uplink module port as a Virtual Chassis port (VCP), removing the uplink module breaks the setting. You must reset the port as a VCP after you replace the module. See Setting an Uplink Module Port as a Virtual Chassis Port (CLI Procedure).

NOTE: On an EX3200 switch, if you install a transceiver in an SFP uplink module or in an SFP+ uplink module when the SFP+ uplink module is operating in the 1-gigabit mode, a corresponding network port from the last four built-in ports is disabled. For example, if you install an SFP or SFP+ transceiver in port 2 on the uplink module (ge-0/1/3), then ge-0/0/23 is disabled. The disabled port is not listed in the output of show interface commands.

When an SFP+ uplink module is operating in 10-gigabit mode:

- Only the 10-gigabit ports (ports 0 and 2) are enabled.
- You can use only SFP+ transceivers in those ports.

When an SFP+ uplink module is operating in 1-gigabit mode:

- All four ports are enabled.
- You can use only SFP transceivers in all four ports.

Before you begin installing an uplink module in an EX3200 or EX4200 switch:

- Ensure that you have taken the necessary precautions to prevent ESD damage (see “Prevention of Electrostatic Discharge Damage on EX Series Switches” on page 236).

Ensure that you have the following parts and tools available:

- Electrostatic discharge (ESD) grounding strap (If a grounding strap is not available, follow the alternative grounding method described in Step 1 of the following procedure.)
- Cross-head screwdriver (provided in the uplink module kit)

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To install an uplink module in an EX3200 or EX4200 switch (see Figure 49 on page 136):

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

   If a grounding strap is not available, hold the uplink module in its antistatic bag in one hand and touch the exposed, bare metal of the switch with the other hand to ground yourself and the component.

2. Loosen the screws that secure the flip-up door covering the empty uplink module slot on the front panel of the switch by using the cross-head screwdriver, flip the door upward, and remove the blanking panel covering the empty uplink module slot.

NOTE: If you are removing an uplink module and installing another uplink module, wait for at least 10 seconds after removing the uplink module before installing the new or the same uplink module. If you do not wait for at least 10 seconds, the interfaces on the uplink module might not come up.

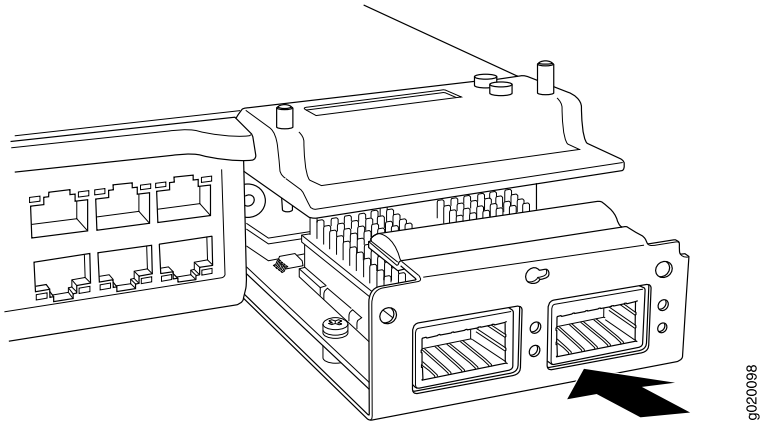
3. Taking care not to touch module components, pins, leads, or solder connections, remove the uplink module from its bag.

CAUTION: Before you slide the uplink module into the slot on the switch chassis, ensure the uplink module is aligned correctly. Misalignment might cause the pins to bend, making the uplink module unusable.

4. Using both hands, place the module in the empty slot and slide it in gently until it is fully seated.
5. Flip the door down and tighten the screws by using the cross-head screwdriver.

NOTE: If the switch does not detect the uplink module, see “Troubleshooting Uplink Module Installation or Replacement on EX3200 and EX4200 Switches” on page 194.

Figure 49: Installing an Uplink Module in an EX3200 or EX4200 Switch



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NOTE: If you have a Juniper J-Care service contract, register any addition, change, or upgrade of hardware components at https://www.juniper.net/customers/csc/management/updateinstallbase.jsp. Failure to do so can result in significant delays if you need replacement parts. This note applies if you change the type of power supply or add a new type of uplink module. It does not apply if you replace these components with the same type of component.

Related Topics

- Troubleshooting Uplink Module Installation or Replacement on EX3200 and EX4200 Switches on page 194
- Removing an Uplink Module from an EX3200 or EX4200 Switch on page 177
- Installing a Transceiver in an EX Series Switch on page 137
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Configuring Gigabit Ethernet Interfaces (CLI Procedure)
- Front Panel of an EX3200 Switch on page 7
- Front Panel of an EX4200 Switch on page 9

Installing a Transceiver in an EX Series Switch

The transceivers for EX Series switches are hot-removable and hot-insertable field-replaceable units (FRUs): You can remove and replace them without powering off the switch or disrupting switch functions.

Use only optical transceivers and optical connectors purchased from Juniper Networks for your EX Series switch.

NOTE: On an EX3200 switch, if you install a transceiver in a 1-gigabit uplink module port, a corresponding network port from the last four built-in ports is disabled. For example, if you install a transceiver in the 1-gigabit uplink module port 2 (ge-0/1/3), then built-in port 23 (ge-0/0/23) is disabled. The disabled port is not listed in the output of show interface commands.

Before you begin installing a transceiver in an EX Series switch, ensure that you have taken the necessary precautions for safe handling of lasers (see “Laser and LED Safety Guidelines and Warnings for EX Series Switches” on page 213).

Ensure that you have a rubber safety cap available to cover the transceiver.

Figure 50 on page 138 shows how to install an SFP transceiver. The procedure is the same for all transceiver types.

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To install a transceiver in an EX Series switch:

CAUTION: To avoid electrostatic discharge (ESD) damage to the transceiver, do not touch the connector pins at the end of the transceiver.

1. Remove the transceiver from its bag.
2. Check to see whether the transceiver is covered by a rubber safety cap. If it is not, cover the transceiver with a rubber safety cap.

WARNING: Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable. The rubber safety cap keeps the port clean and prevents accidental exposure to laser light.

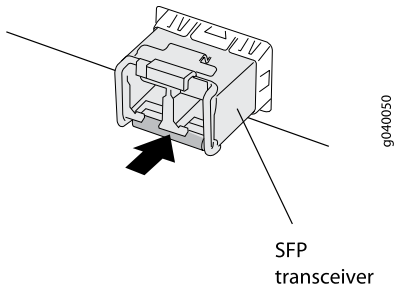
3. If the port in which you want to install the transceiver is covered with a dust cover, remove the dust cover and save it in case you need to cover the port later. If you are hot-swapping a transceiver, wait for at least 10 seconds after removing the transceiver from the port before installing a transceiver.
4. Using both hands, carefully place the transceiver in the empty port. The connectors must face the switch chassis.

CAUTION: Before you slide the transceiver into the port, ensure the transceiver is aligned correctly. Misalignment might cause the pins to bend, making the transceiver unusable.

5. Slide the transceiver in gently until it is fully seated.
6. Remove the rubber safety cap when you are ready to connect the cable to the transceiver.

WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

Figure 50: Installing a Transceiver in an EX Series Switch



Related Topics

- Removing a Transceiver from an EX Series Switch on page 179

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- Connecting a Fiber-Optic Cable to an EX Series Switch on page 158
- Optical Interface Support in EX2200 Switches
- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- Optical Interface Support in EX4500 Switches
- Optical Interface Support in EX8200 Switches

Connecting a Virtual Chassis Cable to an EX4200 Switch

EX4200 switches have two Virtual Chassis ports on the rear panel. You can use the Virtual Chassis ports to interconnect up to 10 EX4200 switches, enabling them to operate as a unified single high bandwidth switch. To see illustrations of a few Virtual Chassis cabling configuration examples, see "Virtual Chassis Cabling Configuration Examples for EX4200 Switches" on page 107.

Ensure that you have the following parts and tools available:

- A cross-head screwdriver (provided in the uplink module kit)

NOTE: If you order Virtual Chassis cables separately, you must reuse the locking covers provided with the original cable or order Virtual Chassis cable locking covers also separately.

To connect a Virtual Chassis cable to an EX4200 switch (see Figure 51 on page 140):

1. Taking care not to touch module components, pins, leads, or solder connections, remove the Virtual Chassis cable from its bag.
2. Using both hands, place the Virtual Chassis cable connector in the empty Virtual Chassis port and slide it in gently until it is fully seated.
3. Slide the locking cover over the Virtual Chassis cable connector.
4. Tighten the screws on the locking cover by using the cross-head screwdriver.

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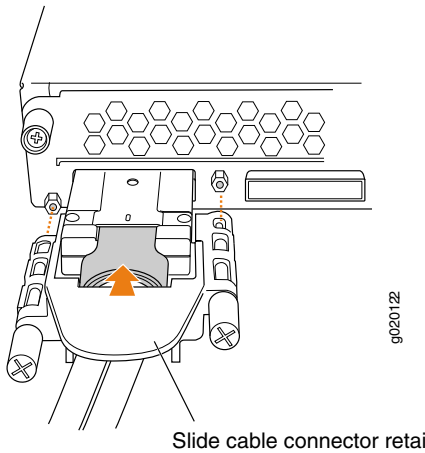
Figure 51: Connecting a Virtual Chassis Cable to an EX4200 Switch



Related Topics

- Disconnecting a Virtual Chassis Cable from an EX4200 Switch on page 182
- Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch on page 105
- Understanding Virtual Chassis Components
- Planning the Virtual Chassis on page 106
- Virtual Chassis Ports Connector Pinout Information for EX4200 Switches on page 81

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CHAPTER 11

Connecting the Switch

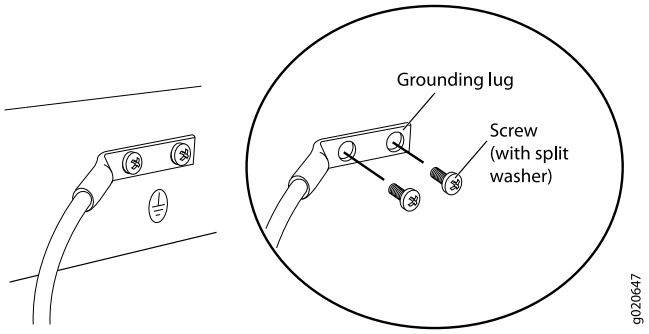
- Connecting Earth Ground to an EX Series Switch on page 141
- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Connecting an EX Series Switch to a Network for Out-of-Band Management on page 152
- Connecting an EX Series Switch to a Management Console on page 153
- Connecting an EX Series Switch to a Modem on page 155
- Connecting a Fiber-Optic Cable to an EX Series Switch on page 158

Connecting Earth Ground to an EX Series Switch

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect the switches to earth ground before you connect them to power.

For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the EX Series switch chassis to connect to the earth ground (see Figure 52 on page 141).

Figure 52: Connecting a Grounding Cable to an EX Series Switch



Before you connect earth ground to the protective earthing terminal of an EX Series switch, ensure that a licensed electrician has attached an appropriate grounding lug to the grounding cable.

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CAUTION: Using a grounding cable with an incorrectly attached lug can damage the switch.

Follow the procedure that applies to your switch:

- Connecting Earth Ground to an EX2200 or EX3200 Switch on page 142
- Connecting Earth Ground to an EX4200 Switch on page 143
- Connecting Earth Ground to an EX4500 Switch on page 144
- Connecting Earth Ground to an EX8208 Switch on page 145
- Connecting Earth Ground to an EX8216 Switch on page 146

Connecting Earth Ground to an EX2200 or EX3200 Switch

The protective earthing terminal is located on the rear of the chassis in an EX2200 switch and in an EX3200 switch.

An AC-powered EX Series switch chassis gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using an AC power cord appropriate for your geographical location. For EX2200 switches, see AC Power Cord Specifications for EX2200 Switches. For EX3200 switches, see "AC Power Cord Specifications for EX3200 and EX4200 Switches" on page 102.

Ensure that you have the following parts and tools available:

- Grounding cable for your switch—The grounding cable must be minimum 14 AWG (2 mm^2), minimum 90°C wire, or as permitted by the local code.
- Grounding lug for your grounding cable—The grounding lug required is a Panduit LCD6-14BH-L or equivalent.
- Washers and 10-32x.25-in. screws to secure the grounding lug to the protective earthing terminal

NOTE: Some early models of EX3200 switches require 10-24x.25-in. screws rather than 10-32x.25-in. screws. If the Juniper Networks product number on the label next to the protective earthing terminal is from 750-021xxx through 750-030xxx, the switch requires 10-24x.25-in. screws.

- Phillips (+) screwdriver, number 2

To connect earth ground to an EX2200 or EX3200 switch:

1. Connect one end of the grounding cable to a proper earth ground, such as the rack in which the switch is mounted.
2. Place the grounding lug attached to the grounding cable over the protective earthing terminal. See Figure 52 on page 141.

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3. Secure the grounding lug to the protective earthing terminal with screws.
4. Dress the grounding cable and ensure that it does not touch or block access to other switch components and that it does not drape where people could trip over it.

Connecting Earth Ground to an EX4200 Switch

The protective earthing terminal is located on the left side of the chassis in an EX4200 switch.

An AC-powered EX Series switch chassis gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using an AC power cord appropriate for your geographical location. See "AC Power Cord Specifications for EX3200 and EX4200 Switches" on page 102.

Ensure that you have the following parts and tools available:

- Grounding cable for your EX4200 switch—The grounding cable must be minimum 14 AWG (2 mm^2), minimum 90°C wire, or as permitted by the local code.
- Grounding lug for your grounding cable—The grounding lug required is a Panduit LCD6-14BH-L or equivalent.
- Washers and 10-32x.25-in. screws to secure the grounding lug to the protective earthing terminal

NOTE: Some early models of EX4200 switches require 10-24x.25-in. screws rather than 10-32x.25-in. screws. If the Juniper Networks product number on the label next to the protective earthing terminal is from 750-021xxx through 750-030xxx, the switch requires 10-24x.25-in. screws.

- Phillips (+) screwdriver, number 2

To connect earth ground to an EX4200 switch:

1. Connect one end of the grounding cable to a proper earth ground, such as the rack in which the switch is mounted.
2. Place the grounding lug attached to the grounding cable over the protective earthing terminal. See Figure 52 on page 141.

   If you mounted an EX4200 switch on four posts of a rack using the four-post rack-mount kit, the protective earthing terminal on the switch is accessible through the slot on the left rear bracket. See Figure 53 on page 144.

NOTE: The protective earthing terminal on an EX4200 switch mounted on four posts is available only if the rack is 27.5 in. deep through 30.5 in. deep for a switch mounted flush with the rack front and 29.5 in. deep through 32.5 in. deep for a switch mounted 2 in. recessed from the rack front.

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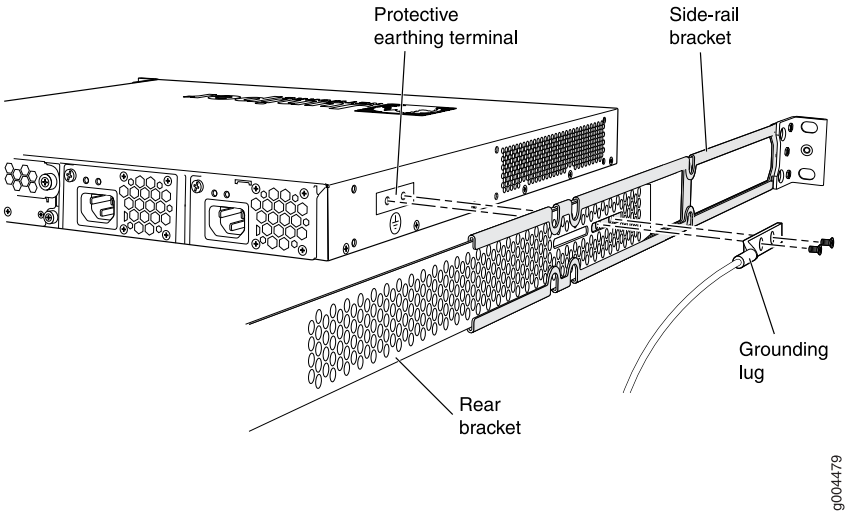
Figure 53: Connecting the Grounding Lug to an EX4200 Switch on a Four-Post Rack



NOTE: The brackets must be attached to the chassis before the grounding lug is attached. (The brackets are shown pulled away from the chassis so that the protective earthing terminal can be seen.)

3. Secure the grounding lug to the protective earthing terminal with screws.
4. Dress the grounding cable and ensure that it does not touch or block access to other switch components and that it does not drape where people could trip over it.

Connecting Earth Ground to an EX4500 Switch

The protective earthing terminal is located on the left rear of the chassis in an EX4500 switch.

An AC-powered EX Series switch chassis gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using an AC power cord appropriate for your geographical location. See AC Power Cord Specifications for an EX4500 Switch.

NOTE: If you plan to mount your switch on four posts of a rack or cabinet, mount your switch in the rack or cabinet before attaching the grounding lug to the switch. See Mounting an EX4500 Switch on Four Posts in a Rack or Cabinet

Ensure that you have the following parts and tools available:

- Grounding cable for your EX4500 switch—The grounding cable must be 14 AWG (2 mm^2), minimum 90ºC wire, or as permitted by the local code.
- Grounding lug for your grounding cable. See Grounding Cable and Lug Specifications for EX4500 Switches.

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- Washers and 10-32x.25-in. screws to secure the grounding lug to the protective earthing terminal
- Phillips (+) screwdriver, number 2

To connect earth ground to an EX4500 switch:

1. Connect one end of the grounding cable to a proper earth ground, such as the rack in which the switch is mounted.
2. Place the grounding lug attached to the grounding cable over the protective earthing terminal. See Figure 52 on page 141.

NOTE: If you mounted the switch on four posts of a rack using the four-post rack-mount kit, the protective earthing terminal on the switch is accessible through the slot on the left rear bracket.

The protective earthing terminal on the switch mounted on four posts is available only if the rack is 27.5 in. deep through 30.5 in. deep for a switch mounted flush with the rack front and 29.5 in. deep through 32.5 in. deep for a switch mounted 2 in. recessed from the rack front.

3. Secure the grounding lug to the protective earthing terminal with screws.
4. Dress the grounding cable and ensure that it does not touch or block access to other switch components and that it does not drape where people could trip over it.

Connecting Earth Ground to an EX8208 Switch

The protective earthing terminal is located on the left side of the chassis in an EX8208 switch.

An AC-powered EX Series switch chassis gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using an AC power cord appropriate for your geographical location. See AC Power Cord Specifications for an EX8200 Switch.

Ensure that you have the following parts and tools available:

- Grounding cable for your EX8208 switch—The grounding cable must be 6 AWG (13.3 mm^2), minimum 60°C wire, or as permitted by the local code.
- Grounding lug for your grounding cable. See Grounding Cable and Lug Specifications for EX8200 Switches.
- Washers and ¼-20x.75-in. screws to secure the grounding lug to the protective earthing terminal
- Phillips (+) screwdriver, number 2

To connect earth ground to an EX8208 switch:

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1. Connect one end of the grounding cable to a proper earth ground, such as the rack in which the switch is mounted.
2. Place the grounding lug attached to the grounding cable over the protective earthing terminal. See Figure 52 on page 141.
3. Secure the grounding lug to the protective earthing terminal with screws.
4. Dress the grounding cable and ensure that it does not touch or block access to other switch components and that it does not drape where people could trip over it.

Connecting Earth Ground to an EX8216 Switch

There are two protective earthing terminals on an EX8216 switch: one on the left side of the chassis and the other on the rear of the chassis. Only one of the two protective earthing terminals needs to be permanently connected to earth ground.

An AC-powered EX Series switch chassis gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using an AC power cord appropriate for your geographical location. See AC Power Cord Specifications for an EX8200 Switch.

Ensure that you have the following parts and tools available:

- Grounding cable for your EX8216 switch—The grounding cable must be 2 AWG (33.6 mm^2), minimum 60°C wire, or as permitted by the local code.
- Grounding lug for your grounding cable. See Grounding Cable and Lug Specifications for EX8200 Switches.
- Washers and ¼-20x.5/8-in. screws to secure the grounding lug to the protective earthing terminal
- Phillips (+) screwdriver, number 2

To connect earth ground to an EX8216 switch:

1. Connect one end of the grounding cable to a proper earth ground, such as the rack in which the switch is mounted.
2. Place the grounding lug attached to the grounding cable over the protective earthing terminal. See Figure 52 on page 141.
3. Secure the grounding lug to the protective earthing terminal with screws.
4. Dress the grounding cable and ensure that it does not touch or block access to other switch components and that it does not drape where people could trip over it.

Related Topics

- Connecting AC Power to an EX2200 Switch
- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Connecting AC Power to an EX4500 Switch
- Connecting AC Power to an EX8200 Switch

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- Connecting DC Power to an EX8200 Switch
- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Grounded Equipment Warning for EX Series Switches on page 226

Connecting AC Power to an EX3200 or EX4200 Switch

The power supply in an EX3200 or EX4200 switch is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the rear panel: You can remove and replace it without powering off the switch or disrupting switch functions.

Before you begin connecting AC power to an EX3200 or EX4200 switch:

- Ensure that you have connected the switch chassis to earth ground.

CAUTION: Before you connect power to the switch, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the switch (for example, by causing a short circuit).

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect EX3200 and EX4200 switches to earth ground before you connect them to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the switch chassis to connect to the earth ground. For instructions on connecting earth ground, see "Connecting Earth Ground to an EX Series Switch" on page 141. An EX3200 or EX4200 switch gets additional grounding when you plug the power supply in the switch into a grounded AC power outlet by using the AC power cord appropriate for your geographical location (see "AC Power Cord Specifications for EX3200 and EX4200 Switches" on page 102).

- Install the power supply in the chassis. For instructions on installing a power supply in an EX3200 or EX4200 switch, see "Installing a Power Supply in an EX3200 or EX4200 Switch" on page 132.

NOTE: Each power supply must be connected to a dedicated power source outlet.

Ensure that you have the following parts and tools available:

- A power cord appropriate for your geographical location

To connect AC power to an EX3200 or EX4200 switch:

1. Ensure that the power supplies are fully inserted in the chassis and the screws on their faceplates are tightened.
2. Squeeze the two sides of the power cord retainer clip and insert the L-shaped ends of the wire clip into the holes in the bracket on each side of the AC power cord inlet on the AC power supply faceplate (see Figure 54 on page 148).

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3. Locate the power cord or cords shipped with the switch; the cords have plugs appropriate for your geographical location. See “AC Power Cord Specifications for EX3200 and EX4200 Switches” on page 102.

WARNING: Ensure that the power cord does not block access to switch components or drape where people can trip on it.

4. Insert the coupler end of the power cord into the AC power cord inlet on the AC power supply faceplate.
5. Push the cord into the slot in the adjustment nut of the power cord retainer. Turn the nut until it is tight against the base of the coupler and the slot in the nut is turned 90º from the top of the switch (see Figure 55 on page 148).
6. If the AC power source outlet has a power switch, set it to the OFF (0) position.
7. Insert the power cord plug into an AC power source outlet.
8. If the AC power source outlet has a power switch, set it to the ON (|) position.
9. Verify that the **AC OK** LED on the power supply is lit and is on steadily.

Figure 54: Connecting the AC Power Cord Retainer Clip to an AC Power Supply in an EX3200 or EX4200 Switch

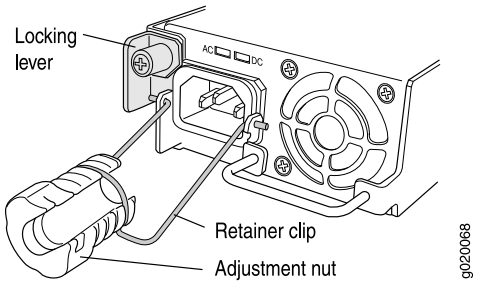
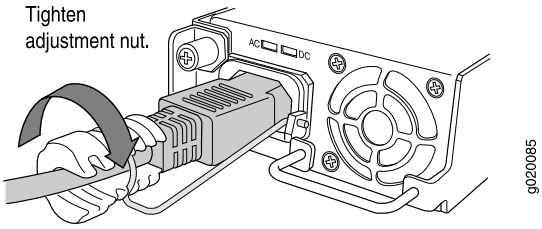


Figure 55: Connecting an AC Power Cord to an AC Power Supply in an EX3200 or EX4200 Switch



Related Topics

- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Power Supply in EX3200 and EX4200 Switches on page 27
- AC Power Supply LEDs in EX3200 and EX4200 Switches on page 30

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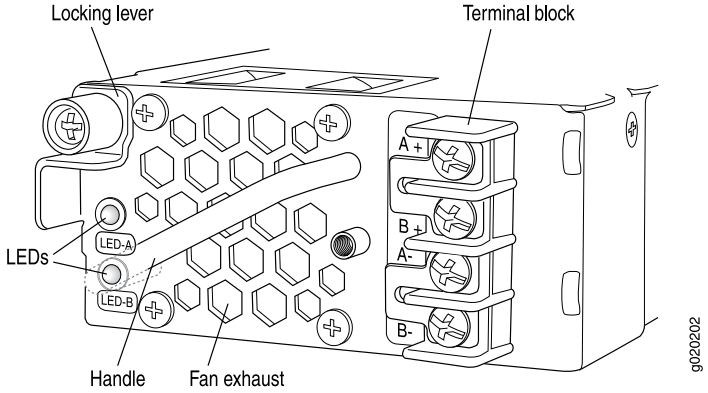
Connecting DC Power to an EX3200 or EX4200 Switch

The power supply in an EX3200 or EX4200 switch is a hot-removable and hot-insertable field-replaceable unit (FRU) located on the rear panel: You can remove and replace it without powering off the switch or disrupting switch functions.

Figure 56: DC Power Supply in an EX3200 or EX4200 Switch



WARNING: DC-powered EX3200 and EX4200 switches are intended for installation only in a restricted access location.

Before you begin connecting DC power to an EX3200 or EX4200 switch:

- Ensure that you have connected the switch chassis to earth ground.

CAUTION: Before you connect power to the switch, a licensed electrician must attach a cable lug to the grounding and power cables that you supply. A cable with an incorrectly attached lug can damage the switch (for example, by causing a short circuit).

To meet safety and electromagnetic interference (EMI) requirements and to ensure proper operation, you must connect EX3200 and EX4200 switches to earth ground before you connect them to power. For installations that require a separate grounding conductor to the chassis, use the protective earthing terminal on the switch chassis to connect to the earth ground. For instructions on connecting earth ground, see “Connecting Earth Ground to an EX Series Switch” on page 141.

- Install the power supply in the chassis. For instructions on installing a power supply in an EX3200 or EX4200 switch, see “Installing a Power Supply in an EX3200 or EX4200 Switch” on page 132.

Ensure that you have the following parts and tools available:

- DC power source cables (12–14 AWG) with ring lug (Molex 190700067 or equivalent) (not provided)
- Phillips (+) screwdriver, number 2

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To connect DC power to an EX3200 or EX4200 switch:

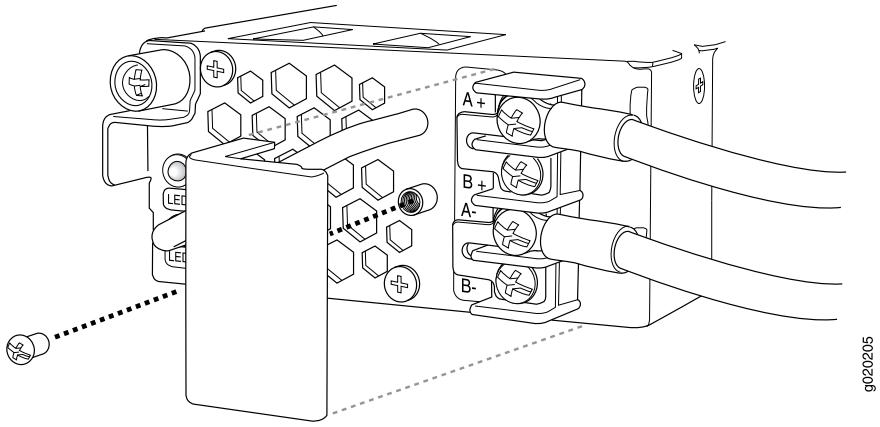
1. Ensure that the power supplies are fully inserted in the chassis and the screws on their faceplates are tightened.
2. Ensure that the input circuit breaker is open so that the voltage across the DC power source cable leads is 0 V and that the cable leads will not become active while you are connecting DC power.

NOTE: The DC power supply in EX3200 and EX4200 switches has four terminals labeled A+, B+, A–, and B– (see Figure 56 on page 149) for connecting DC power source cables labeled positive (+) and negative (–). The DC power supplies for EX3200 and EX4200 switches are shipped with jumpers from A+ input to B+ input tied together and jumpers from A– input to B– input tied together.

NOTE: The A+ and B+ terminals are referred to as +RTN and A– and B– terminals are referred to as –48 V in "DC Power Wiring Sequence Warning for EX Series Switches" on page 244 and "DC Power Electrical Safety Guidelines for EX Series Switches" on page 240.

3. Remove the screw securing the terminal block cover using the screwdriver and remove the terminal block cover (see Figure 57 on page 150). Save the screw.

Figure 57: Removing the Terminal Block Cover from a DC Power Supply in an EX3200 or EX4200 Switch



4. Remove the screws on the terminals using the screwdriver. Save the screws.

WARNING: Ensure that the power cables do not block access to switch components or drape where people can trip on them.

5. Connect the power supplies to the power sources. Secure power source cables to the power supplies by screwing the ring lugs attached to the cables to the appropriate terminals by using the screw from the terminals (see Figure 58 on page 151).

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- To connect a power supply to a power source:

  a. Leave the jumpers on the power supply terminals in place.

  b. Secure the ring lug of the positive (+) DC power source cable to the A+ or B+ terminal on the DC power supply.

  c. Secure the ring lug of the negative (–) DC power source cable to the A– or B– terminal on the DC power supply.

  d. Tighten the screws on the power supply terminals until snug using the screwdriver. Do not overtighten—apply between 8 lb-in. (0.9 Nm) and 9 lb-in. (1.02 Nm) of torque to the screws.

  If you have a second installed power supply, connect it in the same way you did the first.

- To connect one power supply to two power sources:

  a. Remove the jumpers on the power supply terminal block.

  b. Secure the ring lug of the positive (+) DC power source cable from the first DC power source to the A+ terminal on the first DC power supply.

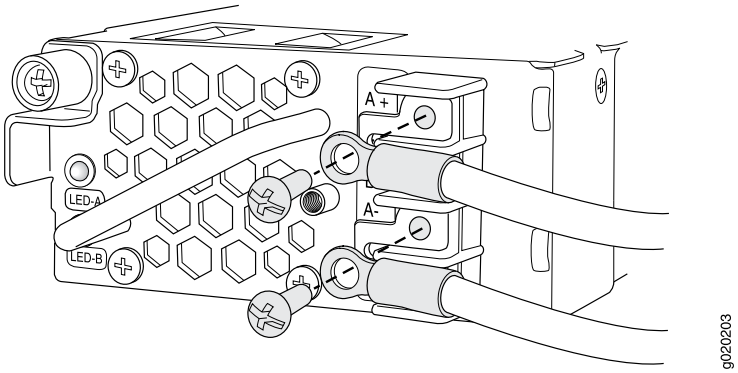
  c. Secure the ring lug of the negative (–) DC power source cable from the first DC power source to the A– terminal on the first DC power supply.

  d. Secure the ring lug of the positive (+) DC power source cable from the second DC power source to the A+ terminal on the second DC power supply.

  e. Secure the ring lug of the negative (–) DC power source cable from the second DC power source to the A– terminal on the second DC power supply.

  f. Tighten the screws on the power supply terminals on both the power supplies until snug using the screwdriver. Do not overtighten—apply between 8 lb-in. (0.9 Nm) and 9 lb-in. (1.02 Nm) of torque to the screws.

Figure 58: Securing Ring Lugs to the Terminals on the DC Power Supply in an EX3200 or EX4200 Switch



6. Replace the terminal block cover and secure it using the screw. Use the screwdriver to tighten the screw.

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7. Close the input circuit breaker.
8. Verify that the LEDs on the power supply are lit green and are on steadily.

Related Topics

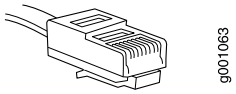
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167
- Power Supply in EX3200 and EX4200 Switches on page 27
- DC Power Supply LEDs in EX3200 and EX4200 Switches on page 30

Connecting an EX Series Switch to a Network for Out-of-Band Management

You can monitor and manage an EX Series switch using a dedicated management channel. EX Series switches have a management port with an RJ-45 connector for out-of-band management. Use the management port to connect the EX Series switch to the management device.

Ensure that you have an Ethernet cable with an RJ-45 connector available. One such cable is provided with the switch. Figure 59 on page 152 shows the RJ-45 connector of the Ethernet cable supplied with the switch.

Figure 59: Ethernet Cable Connector



To connect an EX Series switch to a network for out-of-band management (see Figure 60 on page 153):

1. Connect one end of the Ethernet cable to the management port (labeled **MGMT**) on the EX Series switch.

   For the location of the **MGMT** port on different EX Series switches:

   - See Rear Panel of an EX2200 Switch.
   - See “Rear Panel of an EX3200 Switch” on page 8.
   - See “Rear Panel of an EX4200 Switch” on page 11.
   - See Front Panel of an EX4500 Switch.
   - See Switch Fabric and Routing Engine (SRE) Module in an EX8208 Switch.
   - See Routing Engine (RE) Module in an EX8216 Switch.

2. Connect the other end of the Ethernet cable to the management device.

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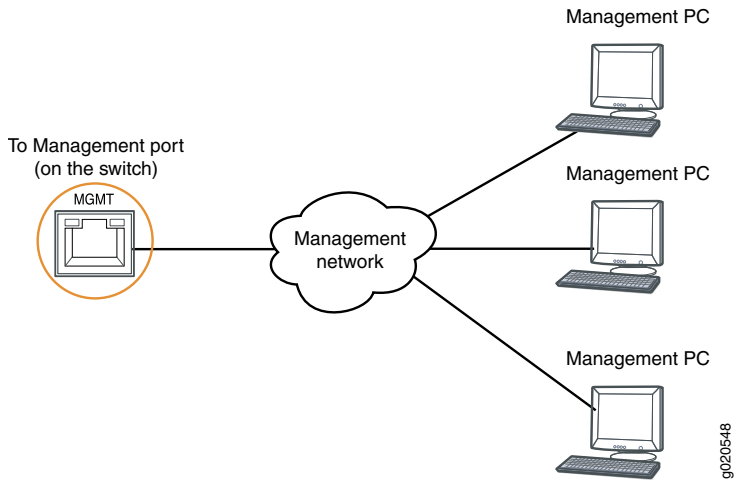
Figure 60: Connecting an EX Series Switch to a Network for Out-of-Band Management



Related Topics

- Connecting an EX Series Switch to a Management Console on page 153
- Management Port Connector Pinout Information for an EX2200 Switch
- Management Port Connector Pinout Information for an EX3200 or EX4200 Switch on page 42
- Management Port Connector Pinout Information for an EX4500 Switch
- Management Port Connector Pinout Information for an EX8200 Switch
- Cables Connecting the EX8200 Switch to Management Devices

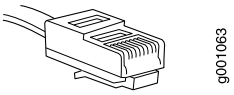
Connecting an EX Series Switch to a Management Console

You can configure and manage an EX Series switch using a dedicated console. Every EX Series switch has a console port with an RJ-45 connector. Use the console port to connect the EX Series switch to the management console or to a console server. The console port accepts a cable with an RJ-45 connector.

Ensure that you have an Ethernet cable with an RJ-45 connector available. An RJ-45 cable and an RJ-45 to DB-9 serial port adapter are supplied with the switch.

Figure 61 on page 153 shows the RJ-45 connector of the Ethernet cable supplied with the switch.

Figure 61: Ethernet Cable Connector



NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to an EX Series switch, use a combination of the RJ-45 to DB-9 female adapter supplied with the switch and a USB to DB-9 male adapter. You must provide the USB to DB-9 male adapter.

To connect an EX Series switch to a management console (see Figure 62 on page 154 and Figure 63 on page 154):

1. Connect one end of the Ethernet cable into the console port (labeled **CON** or **CONSOLE**) on the EX Series switch.

   For the location of the **CON/CONSOLE** port on different EX Series switches:

   - See Rear Panel of an EX2200 Switch.
   - See "Rear Panel of an EX3200 Switch" on page 8.
   - See "Rear Panel of an EX4200 Switch" on page 11.
   - See Front Panel of an EX4500 Switch.
   - See Switch Fabric and Routing Engine (SRE) Module in an EX8208 Switch.
   - See Routing Engine (RE) Module in an EX8216 Switch.

2. Connect the other end of the Ethernet cable into the console server (see Figure 62 on page 154) or management console (see Figure 63 on page 154).

To configure the switch from the management console, see"Connecting and Configuring an EX Series Switch (CLI Procedure)" on page 165 or "Connecting and Configuring an EX Series Switch (J-Web Procedure)" on page 167.

Figure 62: Connecting an EX Series Switch to a Management Console Through a Console Server

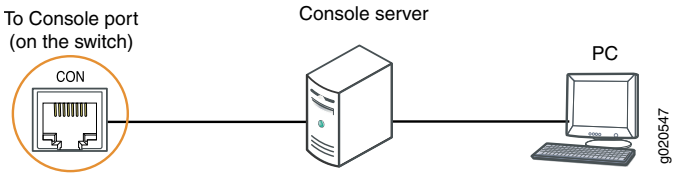
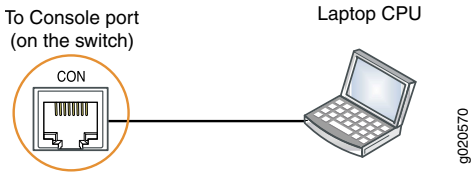


Figure 63: Connecting an EX Series Switch Directly to a Management Console



Related Topics

- Connecting an EX Series Switch to a Network for Out-of-Band Management on page 152
- Console Port Connector Pinout Information for an EX Series Switch on page 41

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- Cables Connecting the EX8200 Switch to Management Devices

Connecting an EX Series Switch to a Modem

You can connect an EX Series switch to a modem through the console port on the switch.

Before you connect the switch to a modem:

- Perform the initial setup and configuration of the switch. See “Connecting and Configuring an EX Series Switch (CLI Procedure)” on page 165 or “Connecting and Configuring an EX Series Switch (J-Web Procedure)” on page 167.

Ensure that you have the following parts available before you begin to connect the switch to the modem:

- A modem (not provided)
- A desktop or notebook computer (not provided)
- An RJ-45 to DB-9 adapter and an Ethernet cable (provided)
- A phone cable (not provided)
- If your computer does not have a DB-9 male connector pin, a USB to DB-9 male adapter (not provided)
- An adapter to connect the RS-232 DB-25 connector on the modem to the RJ-45 to DB-9 adapter on the switch (not provided)

This topic describes:

1. Setting the Serial Console Speed for the Switch on page 155
2. Configuring the Modem on page 156
3. Connecting the Modem to the Console Port on page 157

Setting the Serial Console Speed for the Switch

Before you can connect the switch to a modem, the switch’s serial console speed must be set to 115200 baud.

NOTE: The default serial console speed is 9600 baud.

To change the serial console speed:

1. Power on the switch. (If the switch is an EX8208 or EX8216 model, see Powering On an EX8200 Switch.) The loader script starts.
2. You are prompted with:

   ```
   Hit [Enter] to boot immediately, or space bar for command prompt.
   ```

   Press the Spacebar to pause the switch in the loader state (after the Junos OS has loaded on the switch but before the software starts).

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The **loader>** prompt appears.

3. Set the baud rate:

```
loader> set baudrate=115200
```

Press Enter.

4. Press Enter when you see the following message:

```
Switch baud rate to 115200 bps and press Enter.
```

The **loader>** prompt reappears.

5. Save the new serial console speed:

```
loader> save
```

Press Enter. The serial console speed is now set to 115200 baud.

6. Boot the software:

```
loader> boot
```

The boot process proceeds as normal and ends with a login prompt.

Configuring the Modem

Before you connect the modem, you must configure the modem with required port settings.

NOTE: The following procedure uses Hayes-compatible-modem commands to configure the modem. If your modem is not Hayes-compatible, see the documentation for your modem for the equivalent modem commands.

To configure the modem:

1. Connect the modem to the desktop or notebook computer.
2. Power on the modem.
3. From the computer, start your asynchronous terminal emulation application (such as Microsoft Windows HyperTerminal) and select the COM port to which the modem is connected (for example, COM1).
4. Configure the port settings shown in Table 34 on page 156.

Table 34: Port Settings

Port Settings	Value
Bits per second	115200
Data bits	8
Parity	None

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Table 34: Port Settings *(continued)*

Port Settings	Value
Stop bits	1
Flow control	None

5. In the HyperTerminal window, type **at**. Press Enter.

   The modem sends an OK response to verify that it can communicate successfully with the COM port on your desktop or notebook computer.

6. To configure the modem to answer a call on the first ring, type **ats0=1** at the prompt. Press Enter.
7. To configure the modem to accept modem-control DTR signals, type **at&d1** at the prompt. Press Enter.
8. To disable flow control on the modem, type **at&k0** at the prompt. Press Enter.
9. To set the fixed serial port speed on the modem, type **at&b1** at the prompt. Press Enter.

NOTE: You must set the serial port to the fixed speed so that the modem will not adjust the serial port speed to the negotiated line speed.

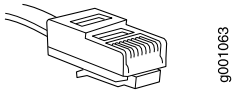
10. To save the new modem settings, type **at&w0** at the prompt. Press Enter.

    The modem sends an OK message. The modem is now ready to be connected to the switch.

Connecting the Modem to the Console Port

The console port on every EX Series switch accepts a cable with an RJ-45 connector. Figure 64 on page 157 shows the RJ-45 connector of the Ethernet cable supplied with the switch.

Figure 64: Ethernet Cable Connector



NOTE: If your laptop or PC does not have a DB-9 male connector pin and you want to connect your laptop or PC directly to the switch, use a combination of the RJ-45 to DB-9 female adapter supplied with the switch and a USB to DB-9 male adapter. You must provide the USB to DB-9 male adapter.

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NOTE: Most modems have an RS-232 DB-25 connector. You must separately purchase an adapter to connect your modem to the RJ-45 to DB-9 adapter and Ethernet cable supplied with the switch.

To connect a modem to the console port:

1. Turn off power to the switch.
2. Turn off power to the modem.
3. Connect one end of the cable to the console port (labeled **CON** or **CONSOLE**) on the switch.

   For the location of the console port on different EX Series switches:

   - See Rear Panel of an EX2200 Switch.
   - See "Rear Panel of an EX3200 Switch" on page 8.
   - See "Rear Panel of an EX4200 Switch" on page 11.
   - See Front Panel of an EX4500 Switch.
   - See Switch Fabric and Routing Engine (SRE) Module in an EX8208 Switch.
   - See Routing Engine (RE) Module in an EX8216 Switch.
4. Connect the other end of the cable to the RJ-45 to DB-9 serial port adapter supplied with your switch.
5. Connect the serial port adapter to the DB-9 female to DB-25 male adapter or other adapter appropriate for your modem.
6. Plug the modem adapter into the DB-25 connector on the modem.
7. Connect one end of the phone cable to the modem and the other end to your telephone network.
8. Turn on the power to your modem.
9. Power on the switch.

Related Topics

- Connecting an EX Series Switch to a Management Console on page 153
- Console Port Connector Pinout Information for an EX Series Switch on page 41

Connecting a Fiber-Optic Cable to an EX Series Switch

EX Series switches have field-replaceable unit (FRU) optical transceivers to which you can connect fiber-optic cables.

Before you begin connecting a fiber-optic cable to an optical transceiver installed in an EX Series switch, ensure that you have taken the necessary precautions for safe handling

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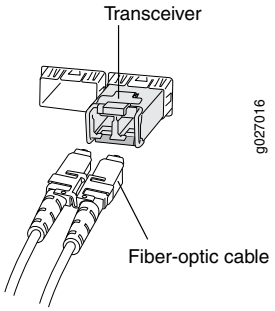
of lasers (see “Laser and LED Safety Guidelines and Warnings for EX Series Switches” on page 213).

To connect a fiber-optic cable to an optical transceiver installed in an EX Series switch:

WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

1. If the fiber-optic cable connector is covered by a rubber safety cap, remove the cap. Save the cap.
2. Remove the rubber safety cap from the optical transceiver. Save the cap.
3. Insert the cable connector into the optical transceiver (see Figure 65 on page 159).

Figure 65: Connecting a Fiber-Optic Cable to an Optical Transceiver Installed in an EX Series Switch



4. Secure the cables so that they are not supporting their own weight. Place excess cable out of the way in a neatly coiled loop. Placing fasteners on a loop helps cables maintain their shape.

CAUTION: Do not bend fiber-optic cables beyond their minimum bend radius. An arc smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.

Do not let fiber-optic cables hang free from the connector. Do not allow fastened loops of cables to dangle, which stresses the cables at the fastening point.

Related Topics

- Disconnecting a Fiber-Optic Cable from an EX Series Switch on page 181
- Installing a Transceiver in an EX Series Switch on page 137
- Maintaining Fiber-Optic Cables in EX Series Switches on page 189
- Optical Interface Support in EX2200 Switches
- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- Optical Interface Support in EX4500 Switches

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- Optical Interface Support in EX8200 Switches

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CHAPTER 12

Performing Initial Configuration

- EX3200 and EX4200 Default Configuration on page 161
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167

EX3200 and EX4200 Default Configuration

Each EX Series switch is programmed with a factory default configuration that contains the values set for each configuration parameter when a switch is shipped. The default configuration file sets values for system parameters such as **syslog** and **commit**; configures Power over Ethernet (PoE), storm control, and Ethernet switching on all interfaces; and enables the LLDP and RSTP protocols.

When you commit changes to the configuration, a new configuration file is created that becomes the active configuration. You can always revert to the factory default configuration. See Reverting to the Default Factory Configuration for the EX Series Switch.

The following factory default configuration file is for an EX3200 or EX4200 switch with 24 ports (for models that have more ports, this default configuration file has more interfaces):

NOTE: In this example, ge-0/0/0 through ge-0/0/23 are the network interface ports. Optional uplink modules provide either two 10-gigabit small form-factor pluggable (XFP) transceivers (xe-0/1/0 and xe-0/1/1) or four 1-gigabit SFP transceivers (ge-0/1/0 through ge-0/1/3). Although you can install only one uplink module, the interfaces for both are shown below.

```
system {
    syslog {
        user * {
            any emergency;
        }
        file messages {
            any notice;
            authorization info;
        }
        file interactive-commands {
            interactive-commands any;
```

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```
        }
    }
    commit {
        factory-settings {
            reset-chassis-lcd-menu;
            reset-virtual-chassis-configuration;
        }
    }
}
interfaces {
    ge-0/0/0 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/1 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/2 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/3 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/4 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/5 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/6 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/7 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/8 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/9 {
```


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```
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/10 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/11 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/12 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/13 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/14 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/15 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/16 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/17 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/18 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/19 {
    unit 0 {
      family ethernet-switching;
    }
  }
  ge-0/0/20 {
    unit 0 {
```

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```
            family ethernet-switching;
        }
    }
    ge-0/0/21 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/22 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/0/23 {
        unit 0 {
            family ethernet-switching;
        }
    }
    xe-0/1/0 {
        unit 0 {
            family ethernet-switching;
        }
    }
    xe-0/1/1 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/1/0 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/1/1 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/1/2 {
        unit 0 {
            family ethernet-switching;
        }
    }
    ge-0/1/3 {
        unit 0 {
            family ethernet-switching;
        }
    }
}
protocols {
    igmp-snooping{
        vlan all;
    }
    lldp {
        interface all;
    }
```


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```
    lldp-med {
      interface all;
    }
    rstp;
  }
  ethernet-switching-options {
    storm-control {
      interface all;
    }
  }
  poe {
    interface all;
  }
```

Related Topics

- Reverting to the Default Factory Configuration for the EX Series Switch
- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167
- Understanding Configuration Files for EX Series Switches
- EX Series Switches Interfaces Overview

Connecting and Configuring an EX Series Switch (CLI Procedure)

There are two ways to connect and configure an EX Series switch: one method is through the console using the CLI and the other is using the J-Web interface. This topic describes the CLI procedure.

NOTE: To run the ezsetup script, the switch must have the factory default configuration as the active configuration. If you have configured anything on the switch and want to run ezsetup, revert to the factory default configuration. See Reverting to the Default Factory Configuration for the EX Series Switch.

Before you begin connecting and configuring an EX Series switch through the console using the CLI:

- Set the following parameter values in the console server or PC:
  - Baud Rate—9600
  - Flow Control—None
  - Data—8
  - Parity—None

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- Stop Bits—1
- DCD State—Disregard

To connect and configure the switch from the console:

1. Connect the console port to a laptop or PC using the RJ-45 to DB-9 serial port adapter. The RJ-45 cable and RJ-45 to DB-9 serial port adapter are supplied with the switch.
   - EX2200, EX3200, or EX4200 switch—The console port is located on the rear panel of the switch.
   - EX4500 switch—The console port is located on the front panel of the switch.
   - EX8200 switch—The console port is located on the Switch Fabric and Routing Engine (SRE) module in slot SRE0 in an EX8208 switch or on the Routing Engine (RE) module in slot RE0 in an EX8216 switch.
2. At the Junos OS shell prompt **root%**, type **ezsetup**.
3. Enter the hostname. This is optional.
4. Enter the root password you plan to use for this device. You are prompted to re-enter the root password.
5. Enter **yes** to enable services like Telnet and SSH. By default, Telnet is not enabled and SSH is enabled.

NOTE: When Telnet is enabled, you will not be able to log in to an EX Series switch through Telnet using root credentials. Root login is allowed only for SSH access.

6. Use the Management Options page to select the management scenario:

NOTE: On EX4500 and EX8200 switches, only the out-of-band management option is available.

   - **Configure in-band management**. In this scenario you have the following two options:
     - Use the default VLAN.
     - Create a new VLAN—If you select this option, you are prompted to specify the VLAN name, VLAN ID, management IP address, and default gateway. Select the ports that must be part of this VLAN.
   - **Configure out-of-band management**. Specify the IP address and gateway of the management interface. Use this IP address to connect to the switch.
7. Specify the SNMP Read Community, Location, and Contact to configure SNMP parameters. These parameters are optional.
8. Specify the system date and time. Select the time zone from the list. These options are optional.

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The configured parameters are displayed. Enter **yes** to commit the configuration.

The configuration is committed as the active configuration for the switch. You can now log in with the CLI or the J-Web interface to continue configuring the switch. If you use the J-Web interface to continue configuring the switch, the Web session is redirected to the new management IP address. If the connection cannot be made, the J-Web interface displays instructions for starting a J-Web session.

Related Topics

- Connecting and Configuring an EX Series Switch (J-Web Procedure) on page 167
- Installing and Connecting an EX2200 Switch
- Installing and Connecting an EX3200 or EX4200 Switch on page 117
- Installing and Connecting an EX4500 Switch
- Installing and Connecting an EX8208 Switch
- Installing and Connecting an EX8216 Switch

Connecting and Configuring an EX Series Switch (J-Web Procedure)

There are two ways to connect and configure an EX Series switch: one method is through the console using the CLI and the other is using the J-Web interface. This topic describes the J-Web procedure.

NOTE: Before you begin the configuration, enable a DHCP client on the management PC you will connect to the switch so that the switch can obtain an IP address dynamically.

NOTE: Read the following steps before you begin the configuration. You must complete the initial configuration using EZSetup within 10 minutes. The switch exits EZSetup after 10 minutes and reverts to the factory default configuration, and the PC loses connectivity to the switch.

- EX2200 switch—The LEDs on the network ports on the front panel blink when the switch is in the initial setup mode.
- EX3200, EX4200, EX4500, or EX8200 switch—The LCD displays a count-down timer when the switch is in initial setup mode.

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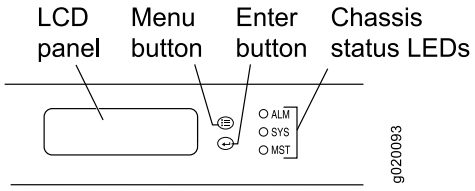
To connect and configure the switch using the J-Web interface:

1. Transition the switch into initial setup mode:
   - EX2200 switch—Press the mode button located on the lower right corner of the front panel for 10 seconds.
   - EX3200, EX4200, EX4500, or EX8200 switch—Use the **Menu** and **Enter** buttons located to the right of the LCD panel (see Figure 66 on page 168):

Figure 66: LCD Panel in an EX3200, EX4200, EX4500, or EX8200 Switch



   1. Press the **Menu** button until you see **MAINTENANCE MENU**. Then press the **Enter** button.
   2. Press **Menu** until you see **ENTER EZSetup**. Then press **Enter**.

      If EZSetup does not appear as an option in the menu, select Factory Default to return the switch to the factory default configuration. EZSetup is displayed in the menu only when the switch is set to the factory default configuration.
   3. Press **Enter** to confirm setup and continue with EZSetup.

2. Connect the Ethernet cable from the Ethernet port on the PC to the switch.
   - EX2200, EX3200, or EX4200 switch—Connect the cable to port 0 (**ge-0/0/0**) on the front panel of the switch.
   - EX4500 switch—Connect the cable to the port labeled **MGMT** on the front panel of the switch.
   - EX8200 switch—Connect the cable to the port labeled **MGMT** on the Switch Fabric and Routing Engine (SRE) module in slot SRE0 in an EX8208 switch or on the Routing Engine (RE) module in slot RE0 in an EX8216 switch.

   These ports are configured as the DHCP server with the default IP address, **192.168.1.1**. The switch can assign an IP address to the management PC in the IP address range **192.168.1.2** through **192.168.1.253**.
3. From the PC, open a Web browser, type **http://192.168.1.1** in the address field, and press Enter.
4. On the J-Web login page, type **root** as the username, leave the password field blank, and click **Login**.
5. On the Introduction page, click **Next**.
6. On the Basic Settings page, modify the hostname, the root password, and date and time settings:

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- Enter the hostname. This is optional.
- Enter a password and reenter the password.
- Specify the time zone.
- Synchronize the date and time settings of the switch with the management PC or set them manually by selecting the appropriate option button. This is optional.

Click **Next**.

7. Use the Management Options page to select the management scenario:

NOTE: On EX4500 and EX8200 switches, only the out-of-band management option is available.

- **In-band Management—Use VLAN 'default' for management**.

  Select this option to configure all data interfaces as members of the default VLAN. Click **Next**. Specify the management IP address and the default gateway for the default VLAN.

- **In-band Management—Create new VLAN for management**.

  Select this option to create a management VLAN. Click **Next**. Specify the VLAN name, VLAN ID, member interfaces, management IP address, and default gateway for the new VLAN.

- **Out-of-band Management—Configure management port**.

  Select this option to configure only the management interface. Click **Next**. Specify the IP address and default gateway for the management interface.

8. Click **Next**.
9. On the Manage Access page, you may select options to enable Telnet, SSH, and SNMP services. For SNMP, you can configure the read community, location, and contact.
10. Click **Next**. The Summary screen displays the configured settings.
11. Click **Finish**.

The configuration is committed as the active switch configuration. You can now log in with the CLI or the J-Web interface to continue configuring the switch.

If you use the J-Web interface to continue configuring the switch, the Web session is redirected to the new management IP address. If the connection cannot be made, the J-Web interface displays instructions for starting a J-Web session.

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NOTE: After the configuration is committed, the connectivity between the PC and the switch might be lost. To renew the connection, release and renew the IP address by executing the appropriate commands on the management PC or by removing and reinserting the Ethernet cable.

Related Topics

- Connecting and Configuring an EX Series Switch (CLI Procedure) on page 165
- Installing and Connecting an EX2200 Switch
- Installing and Connecting an EX3200 or EX4200 Switch on page 117
- Installing and Connecting an EX4500 Switch
- Installing and Connecting an EX8208 Switch
- Installing and Connecting an EX8216 Switch

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PART 4

Removing Switch Components

- Removing Switch Components on page 173

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CHAPTER 13

Removing Switch Components

- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 173
- Removing a Power Supply from an EX3200 or EX4200 Switch on page 174
- Removing a Fan Tray from an EX3200 or EX4200 Switch on page 176
- Removing an Uplink Module from an EX3200 or EX4200 Switch on page 177
- Removing a Transceiver from an EX Series Switch on page 179
- Disconnecting a Fiber-Optic Cable from an EX Series Switch on page 181
- Disconnecting a Virtual Chassis Cable from an EX4200 Switch on page 182
- Replacing a Member Switch of a Virtual Chassis Configuration (CLI Procedure) on page 183

Installing and Removing EX3200 and EX4200 Switch Hardware Components

The EX3200 and EX4200 switch chassis is a rigid sheet-metal structure that houses the hardware components. The field-replaceable units (FRUs) in EX3200 and EX4200 switches are:

- Power supply
- Fan tray
- Uplink module
- SFP transceiver
- SFP+ transceiver
- XFP transceiver

The power supply, fan tray, uplink module, and transceivers are hot-removable and hot-insertable: You can remove and replace them without powering off the switch or disrupting switch functions.

To install a power supply in an EX3200 or EX4200 switch, follow instructions in "Installing a Power Supply in an EX3200 or EX4200 Switch" on page 132. To remove a power supply from an EX3200 or EX4200 switch, follow instructions in "Removing a Power Supply from an EX3200 or EX4200 Switch" on page 174.

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To install a fan tray in an EX3200 or EX4200 switch, follow instructions in “Installing a Fan Tray in an EX3200 or EX4200 Switch” on page 133. To remove a fan tray from an EX3200 or EX4200 switch, follow instructions in “Removing a Fan Tray from an EX3200 or EX4200 Switch” on page 176.

To install an uplink module in an EX3200 or EX4200 switch, follow instructions in “Installing an Uplink Module in an EX3200 or EX4200 Switch” on page 135. To remove an uplink module from an EX3200 or EX4200 switch, follow instructions in “Removing an Uplink Module from an EX3200 or EX4200 Switch” on page 177.

To install an SFP, SFP+, or XFP transceiver in an EX3200 or EX4200 switch, follow instructions in “Installing a Transceiver in an EX Series Switch” on page 137. To remove an SFP, SFP+, or XFP transceiver from an EX3200 or EX4200 switch, follow instructions in “Removing a Transceiver from an EX Series Switch” on page 179.

Related Topics

- Cooling System and Airflow in an EX3200 Switch on page 31
- Cooling System and Airflow in an EX4200 Switch on page 33
- Power Supply in EX3200 and EX4200 Switches on page 27
- Uplink Modules in EX3200 and EX4200 Switches on page 34
- Optical Interface Support in EX3200 and EX4200 Switches on page 43

Removing a Power Supply from an EX3200 or EX4200 Switch

The power supply in EX3200 and EX4200 switches is a hot-removable and hot-insertable field-replaceable unit (FRU): You can remove and replace it without powering off the switch or disrupting switch functions.

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- An antistatic bag or an antistatic mat

CAUTION: Do not leave the power supply slot empty for a long time while the switch is on. The power supply must remain in the chassis for proper airflow.

To remove a power supply from an EX3200 or EX4200 switch (see Figure 67 on page 175):

1. Place the antistatic bag or the antistatic mat on a flat, stable surface.
2. Disconnect power to the switch by performing one of the following:
   - AC power supply—If the AC power source outlet has a power switch, set it to the OFF (0) position. If the AC power source outlet does not have a power switch, gently pull out the male end of the power cord connected to the power source outlet.
   - DC power supply—Switch the circuit breaker on the panel board that services the DC circuit to the OFF position.

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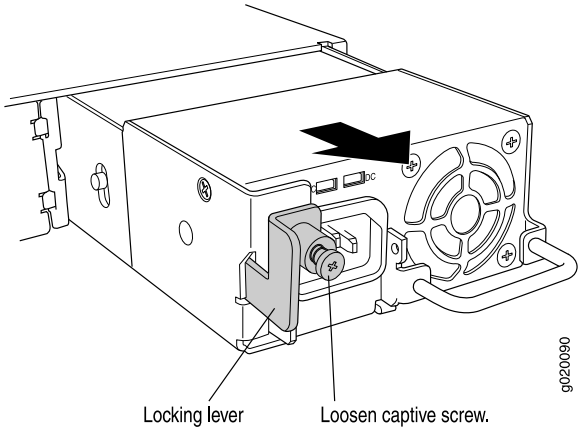
3. Remove the power source cable from the power supply faceplate:
   - AC power supply—Gently pull out the female end of the power cord connected to the power supply faceplate.
   - DC power supply—Remove the screws securing the ring lugs attached to the power source cables to the power supply using the screwdriver, and remove the power source cables from the power supply. Replace the screws on the terminals and tighten them.
4. Loosen the locking lever screw on the left front of the power supply by using the screwdriver.
5. Push down on the locking lever until it is in its lowest position.
6. Grasp the power supply handle and pull firmly to slide it halfway out of the chassis.
7. Place one hand under the power supply to support it and slide it completely out of the chassis. Take care not to touch power supply components, pins, leads, or solder connections.
8. Place the power supply in the antistatic bag or on the antistatic mat placed on a flat, stable surface.

Figure 67: Removing a Power Supply from an EX3200 or EX4200 Switch



Related Topics

- Installing a Power Supply in an EX3200 or EX4200 Switch on page 132
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Power Supply in EX3200 and EX4200 Switches on page 27
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- AC Power Cord Specifications for EX3200 and EX4200 Switches on page 102
- Rear Panel of an EX3200 Switch on page 8
- Rear Panel of an EX4200 Switch on page 11

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Removing a Fan Tray from an EX3200 or EX4200 Switch

EX3200 and EX4200 switches have a single fan tray on the rear panel. The fan tray is a hot-removable and hot-insertable field-replaceable unit (FRU): You can remove and replace it without powering off the switch or disrupting switch functions.

Ensure that you have the following parts and tools available:

- Phillips (+) screwdriver, number 2
- An antistatic bag or an antistatic mat

To remove a fan tray from an EX3200 or EX4200 switch (see Figure 68 on page 176 and Figure 69 on page 177):

1. Place the antistatic bag or the antistatic mat on a flat, stable surface.
2. Loosen the screw or screws securing the fan tray by using the screwdriver.

WARNING: To avoid injury, do not touch the fan with your hands or any tools as you slide the fan tray out of the chassis—the fan may still be running.

3. Grasp the handle on the fan tray and pull firmly to slide the fan tray halfway out of the chassis.
4. When the fan stops spinning, slide the fan tray completely out of the chassis.
5. Place the fan tray in the antistatic bag or on the antistatic mat placed on a flat, stable surface.

Figure 68: Removing a Fan Tray from an EX3200 Switch

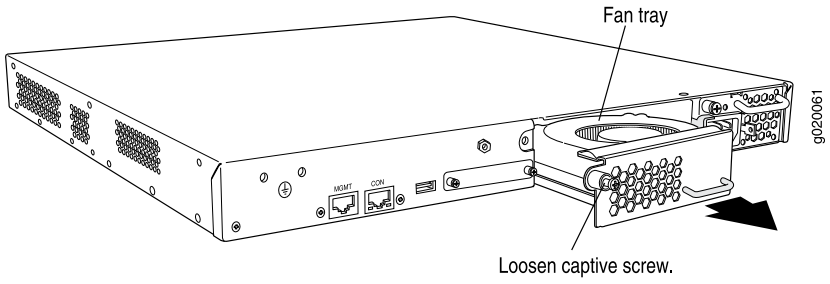

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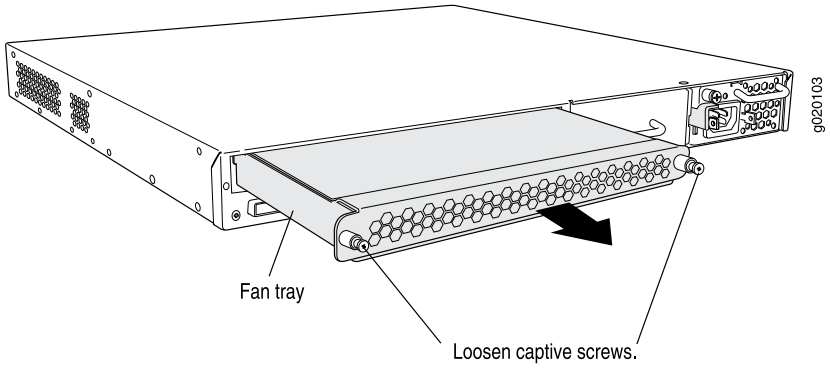
Figure 69: Removing a Fan Tray from an EX4200 Switch



NOTE: When a fan tray is removed, **Fan/Blower is Absent** is logged in the system log and the system raises a minor alarm.

Related Topics

- Installing a Fan Tray in an EX3200 or EX4200 Switch on page 133
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Cooling System and Airflow in an EX3200 Switch on page 31
- Cooling System and Airflow in an EX4200 Switch on page 33
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Rear Panel of an EX3200 Switch on page 8
- Rear Panel of an EX4200 Switch on page 11

Removing an Uplink Module from an EX3200 or EX4200 Switch

If your EX3200 or EX4200 switch includes an optional uplink module, it is installed in the switch's front panel. The different types of uplink modules are described in “Uplink Modules in EX3200 and EX4200 Switches” on page 34.

The uplink module in EX3200 and EX4200 switches is a hot-removable and hot-insertable unit (FRU): You can remove and replace it without powering off the switch or disrupting switch functions.

NOTE: If you have set an uplink module port as a Virtual Chassis port (VCP), removing the uplink module breaks the setting. You must reset the port as a VCP after you replace the module. See Setting an Uplink Module Port as a Virtual Chassis Port (CLI Procedure).

Before you begin removing an uplink module from an EX3200 or EX4200 switch:

- Ensure that you have taken the necessary precautions to prevent ESD damage (see “Prevention of Electrostatic Discharge Damage on EX Series Switches” on page 236).

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- If there are any transceivers installed in the uplink module, remove them before you remove the uplink module. For instructions on removing transceivers, see “Removing a Transceiver from an EX Series Switch” on page 179.

Ensure that you have the following parts and tools available:

- Electrostatic discharge (ESD) grounding strap (If a grounding strap is not available, follow the alternative grounding method described in Step 1 of the following procedure.)
- Cross-head screwdriver (provided in the uplink module kit)
- An antistatic bag or antistatic mat

To remove an uplink module from an EX3200 or EX4200 switch:

1. Attach the electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.

   If a grounding strap is not available, touch the exposed, bare metal of the switch with the other hand to ground yourself and the component.
2. Loosen the screws that secure the flip-up door covering the uplink module slot on the front panel of the switch by using the cross-head screwdriver provided with the uplink module kit and flip the door upward.
3. Insert the ball end of the screwdriver in the keyhole on the front panel of the uplink module and slide the screwdriver to the narrow part of the keyhole (see Figure 70 on page 179).

CAUTION: Ensure the screwdriver does not slip out of the keyhole when you pull the uplink module out of the switch chassis.

4. Using both hands, gently pull the screwdriver to slide the uplink module halfway out of the chassis (see Figure 71 on page 179).
5. Place one hand under the uplink module to support it and slide it completely out of the chassis.
6. Slide the screwdriver out of the keyhole.
7. Place the uplink module in an antistatic bag or on an antistatic mat placed on a flat, stable surface.

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Figure 70: Sliding the Screwdriver to the Narrow Part of the Keyhole

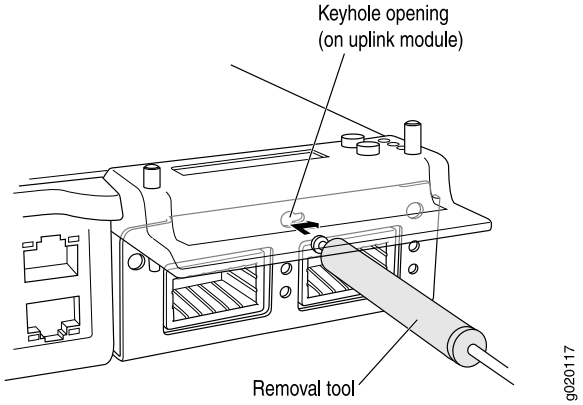
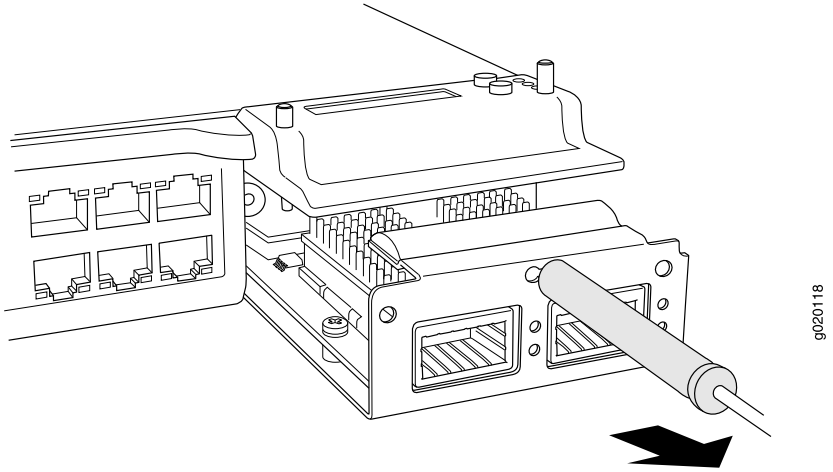


Figure 71: Removing an Uplink Module from an EX3200 or EX4200 Switch



Related Topics

- Installing an Uplink Module in an EX3200 or EX4200 Switch on page 135
- Installing and Removing EX3200 and EX4200 Switch Hardware Components on page 131
- Field-Replaceable Units in EX3200 and EX4200 Switches on page 18
- Front Panel of an EX3200 Switch on page 7
- Front Panel of an EX4200 Switch on page 9

Removing a Transceiver from an EX Series Switch

The transceivers for EX Series switches are hot-removable and hot-insertable field-replaceable units (FRUs): You can remove and replace them without powering off the switch or disrupting switch functions.

Before you begin removing a transceiver from an EX Series switch, ensure that you have taken the necessary precautions for safe handling of lasers (see “Laser and LED Safety Guidelines and Warnings for EX Series Switches” on page 213).

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Ensure that you have the following parts and tools available:

- An antistatic bag or an antistatic mat
- Needlenose pliers
- Rubber safety caps to cover the transceiver and fiber-optic cable connector
- A dust cover to cover the port

Figure 72 on page 181 shows how to remove an SFP transceiver. The procedure is the same for all transceiver types.

To remove a transceiver from an EX Series switch:

1. Place the antistatic bag or antistatic mat on a flat, stable surface.
2. Label the cable connected to the transceiver so that you can reconnect it correctly.

WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

WARNING: Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable. The rubber safety cap keeps the port clean and prevents accidental exposure to laser light.

CAUTION: Do not bend fiber-optic cables beyond their minimum bend radius. An arc smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.

3. Remove the cable connected to the transceiver (see “Disconnecting a Fiber-Optic Cable from an EX Series Switch” on page 181). Cover the transceiver and the end of each fiber-optic cable connector with a rubber safety cap immediately after disconnecting the fiber-optic cables.
4. Using your fingers, pull the ejector lever on the transceiver to unlock the transceiver.

CAUTION: Before removing the transceiver, make sure you open the ejector lever completely until you hear it click. This prevents damage to the transceiver.

5. Using the needlenose pliers, pull the ejector lever out from the transceiver.
6. Grasp the transceiver ejector lever and gently slide the transceiver approximately 0.5 in. (1.3 cm) straight out of the port.

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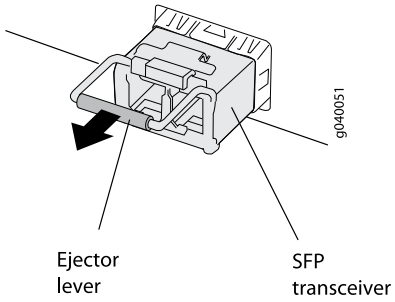
CAUTION: To avoid electrostatic discharge (ESD) damage to the transceiver, do not touch the connector pins at the end of the transceiver.

7. Using your fingers, grasp the body of the transceiver and pull it straight out of the port.
8. Place the transceiver in the antistatic bag or on the antistatic mat placed on a flat, stable surface.
9. Place the dust cover over the empty port.

Figure 72: Removing a Transceiver from an EX Series Switch



Related Topics

- Installing a Transceiver in an EX Series Switch on page 137
- Optical Interface Support in EX2200 Switches
- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- Optical Interface Support in EX4500 Switches
- Optical Interface Support in EX8200 Switches

Disconnecting a Fiber-Optic Cable from an EX Series Switch

EX Series switches have field-replaceable unit (FRU) optical transceivers to which you can connect fiber-optic cables.

Before you begin disconnecting a fiber-optic cable from an optical transceiver installed in an EX Series switch, ensure that you have taken the necessary precautions for safe handling of lasers (see “Laser and LED Safety Guidelines and Warnings for EX Series Switches” on page 213).

Ensure that you have the following parts and tools available:

- A rubber safety cap to cover the transceiver
- A rubber safety cap to cover the fiber-optic cable connector

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To disconnect a fiber-optic cable from an optical transceiver installed in the switch:

1. Disable the port in which the transceiver is installed by issuing the command:

```
[edit interfaces]
user@switch# set interface-name disable
```

WARNING: Do not look directly into a fiber-optic transceiver or into the ends of fiber-optic cables. Fiber-optic transceivers and fiber-optic cables connected to transceivers emit laser light that can damage your eyes.

2. Carefully unplug the fiber-optic cable connector from the transceiver.
3. Cover the transceiver with a rubber safety cap.

WARNING: Do not leave a fiber-optic transceiver uncovered except when inserting or removing a cable. The rubber safety cap keeps the port clean and prevents accidental exposure to laser light.

4. Cover the fiber-optic cable connector with the rubber safety cap.

Related Topics

- Connecting a Fiber-Optic Cable to an EX Series Switch on page 158
- Removing a Transceiver from an EX Series Switch on page 179
- Maintaining Fiber-Optic Cables in EX Series Switches on page 189
- Optical Interface Support in EX2200 Switches
- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- Optical Interface Support in EX4500 Switches
- Optical Interface Support in EX8200 Switches

Disconnecting a Virtual Chassis Cable from an EX4200 Switch

If you need to disconnect an EX4200 switch from a Virtual Chassis configuration, you need to disconnect the Virtual Chassis cable from the Virtual Chassis ports (VCPs).

Ensure that you have the following parts and tools available:

- A cross-head screwdriver (provided in the uplink module kit)

To disconnect a Virtual Chassis cable from an EX4200 switch (see Figure 73 on page 183):

1. Loosen the screws on the locking cover by using the cross-head screwdriver.
2. Slide the locking cover back.

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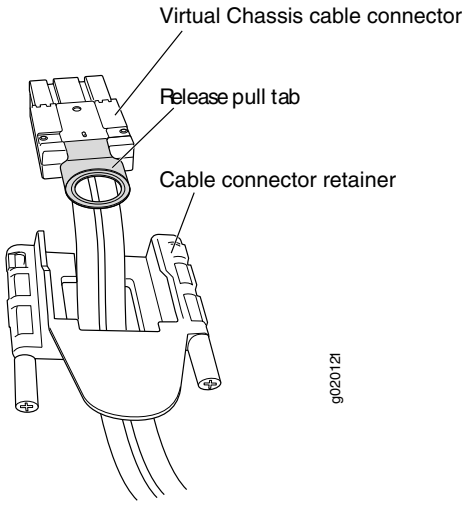
3. Gently pull the release pull tab on the Virtual Chassis cable connector to release the lock holding the Virtual Chassis cable connector in the Virtual Chassis port.
4. Gently pull the Virtual Chassis cable connector out of the Virtual Chassis port.

Figure 73: Virtual Chassis Cable Connector in an EX4200 Switch



NOTE: If you order Virtual Chassis cables separately, you must reuse the locking covers provided with the original cable or order Virtual Chassis cable locking covers also separately.

Related Topics

- Connecting a Virtual Chassis Cable to an EX4200 Switch on page 139
- Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch on page 105
- Understanding Virtual Chassis Components
- Planning the Virtual Chassis on page 106
- Virtual Chassis Ports Connector Pinout Information for EX4200 Switches on page 81

Replacing a Member Switch of a Virtual Chassis Configuration (CLI Procedure)

You can replace a member switch of a Virtual Chassis configuration without disrupting network service for the other members. You can retain the existing configuration of the member switch and apply it to a new member switch, or you can free up the member ID and make it available for assignment to a new member switch.

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To replace a member switch, use the procedure that matches what you need to accomplish:

- Remove, Repair, and Reinstall the Same Switch on page 184
- Remove a Member Switch, Replace with a Different Switch, and Reapply the Old Configuration on page 184
- Remove a Member Switch and Make Its Member ID Available for Reassignment to a Different Switch on page 185

Remove, Repair, and Reinstall the Same Switch

If you need to repair a member switch, you can remove it from the Virtual Chassis configuration without disrupting network service for the other members. The master stores the configuration of the member ID so that it can be reapplied when the member switch (with the same base MAC address) is reconnected.

1. Power off and disconnect the member switch to be repaired.
2. Repair, as necessary.
3. Reconnect and power on the member switch.

Remove a Member Switch, Replace with a Different Switch, and Reapply the Old Configuration

If you are unable to repair a member switch, you can replace it with a different member switch and retain the old configuration. The master stores the configuration of the member that was removed. When you connect a different member switch, the master assigns a new member ID. But the old configuration is still stored under the previous member ID of the previous member switch.

NOTE: If you have used a preprovisioned configuration, use the **replace** command to change the serial number in the Virtual Chassis configuration file. Substitute the serial number of the replacement member switch (on the back of the switch) for the serial number of the member switch that was removed.

1. Power off and disconnect the member switch to be replaced.
2. If the replacement member switch has been previously configured, revert that switch's configuration to the factory defaults. See Reverting to the Default Factory Configuration for the EX Series Switch.
3. Connect and power on the replacement member switch.
4. Note the member ID displayed on the front panel.
5. Issue the **request virtual-chassis renumber** command from the Virtual Chassis master to change the member switch's current member ID to the member ID that belonged to the member switch that was removed from the Virtual Chassis configuration).

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Remove a Member Switch and Make Its Member ID Available for Reassignment to a Different Switch

When you remove a member switch from the Virtual Chassis configuration, the master keeps its member ID on reserve. To make that member switch's member ID available for reassignment, issue the request virtual-chassis recycle command from the Virtual Chassis master.

NOTE: When you add or delete members in a Virtual Chassis configuration, internal routing changes might cause temporary traffic loss for a few seconds.

Related Topics

- Monitoring Virtual Chassis Configuration Status and Statistics
- Adding a New Switch to an Existing Virtual Chassis Configuration (CLI Procedure) on page 109

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PART 5

Switch and Component Maintenance

- Routine Maintenance on page 189

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CHAPTER 14

Routine Maintenance

- Maintaining Fiber-Optic Cables in EX Series Switches on page 189

Maintaining Fiber-Optic Cables in EX Series Switches

Fiber-optic cables connect to optical transceivers that are installed in EX Series switches.

To maintain fiber-optic cables:

- When you unplug a fiber-optic cable from a transceiver, place rubber safety caps over the transceiver and on the end of the cable.
- Anchor fiber-optic cables to avoid stress on the connectors. When attaching a fiber-optic cable to a transceiver, be sure to secure the fiber-optic cable so that it is not supporting its own weight as it hangs to the floor. Never let a fiber-optic cable hang free from the connector.
- Avoid bending fiber-optic cables beyond their minimum bend radius. Bending fiber-optic cables into arcs smaller than a few inches in diameter can damage the cables and cause problems that are difficult to diagnose.
- Frequent plugging and unplugging of fiber-optic cables in and out of optical instruments can damage the instruments, which are expensive to repair. Attach a short fiber extension to the optical equipment. Any wear and tear due to frequent plugging and unplugging is then absorbed by the short fiber extension, which is easier and less expensive to replace than the instruments.
- Keep fiber-optic cable connections clean. Micro-deposits of oil and dust in the canal of the transceiver or cable connector can cause loss of light, reduction in signal power, and possibly intermittent problems with the optical connection.

  To clean the transceiver canal, use an appropriate fiber-cleaning device such as RIFOCS Fiber Optic Adaptor Cleaning Wands (part number 946). Follow the directions in the cleaning kit you use.

  After cleaning the transceiver, make sure that the connector tip of the fiber-optic cable is clean. Use only an approved alcohol-free fiber-optic cable cleaning kit such as the Opptex Cletop-S® Fiber Cleaner. Follow the directions in the cleaning kit you use.

Related Topics

- Handling and Storing Line Cards in EX8200 Switches
- Maintaining Line Card Cables in EX8200 Switches

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- Connecting a Fiber-Optic Cable to an EX Series Switch on page 158
- Laser and LED Safety Guidelines and Warnings for EX Series Switches on page 213
- Optical Interface Support in EX2200 Switches
- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- Optical Interface Support in EX4500 Switches
- Optical Interface Support in EX8200 Switches

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PART 6

Troubleshooting Switch Components

- Troubleshooting Switch Components on page 193

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CHAPTER 15

Troubleshooting Switch Components

- Troubleshooting Network Interfaces on EX3200 and EX4200 Switches on page 193
- Troubleshooting Uplink Module Installation or Replacement on EX3200 and EX4200 Switches on page 194

Troubleshooting Network Interfaces on EX3200 and EX4200 Switches

This topic provides troubleshooting information for specific problems related to interfaces on EX3200 and EX4200 switches.

- The interface on one of the last four built-in network ports in an EX3200 switch (for example, interface ge-0/0/23) is down on page 193
- The interface on the port in which an SFP or SFP+ transceiver is installed in an SFP+ uplink module is down on page 194

The interface on one of the last four built-in network ports in an EX3200 switch (for example, interface ge-0/0/23) is down

Problem The interface on one of the last four built-in ports (**ge-0/0/20** through **ge-0/0/23** on 24-port models or **ge-0/0/44** through **ge-0/0/47** on 48-port models) of an EX3200 switch is down.

An SFP or SFP+ uplink module is installed in the switch and a transceiver is installed in one of the ports on the uplink module.

When you check the status with the CLI command **show interfaces ge-** or with the J-Web user interface, the disabled port is not listed.

Cause The last four built-in ports use the same ASIC as the SFP uplink module. Therefore, if you install a transceiver in an SFP or SFP+ uplink module installed in an EX3200 switch, a corresponding base port from the last four built-in ports is disabled.

Solution If you need to use the disabled built-in port, you must remove the transceiver from the SFP or SFP+ uplink module. Alternatively, you can install an XFP uplink module instead of an SFP or SFP+ uplink module. There is no conflict between the built-in network ports and the ports on the XFP uplink modules.

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The interface on the port in which an SFP or SFP+ transceiver is installed in an SFP+ uplink module is down

Problem The interface on the port in which an SFP or SFP+ transceiver is installed in an SFP+ uplink module installed in an EX3200 or EX4200 switch is down.

When you check the status with the CLI command **show interfaces ge-** or with the J-Web user interface, the disabled port is not listed.

Cause By default, the SFP+ uplink module operates in the 10-gigabit mode and supports only SFP+ transceivers. The operating mode for the module is incorrectly set.

Solution Either SFP+ or SFP transceivers can be installed in SFP+ uplink modules. You must configure the operating mode of the SFP+ uplink module to match the type of transceiver you want to use. For SFP+ transceivers, configure the 10-gigabit operating mode and for SFP transceivers, configure the 1-gigabit operating mode. See Setting the Mode on an SFP+ Uplink Module (CLI Procedure).

Related Topics

- Troubleshooting Uplink Module Installation or Replacement on EX3200 and EX4200 Switches on page 194
- Monitoring Interface Status and Traffic
- Configuring Gigabit Ethernet Interfaces (CLI Procedure)
- Configuring Gigabit Ethernet Interfaces (J-Web Procedure)
- Removing a Transceiver from an EX Series Switch on page 179
- Uplink Modules in EX3200 and EX4200 Switches on page 34
- EX Series Switches Interfaces Overview

Troubleshooting Uplink Module Installation or Replacement on EX3200 and EX4200 Switches

This topic provides troubleshooting information for specific problems related to uplink module ports on EX3200 and EX4200 switches.

1. Virtual Chassis port (VCP) connection does not work on page 194
2. One of the last four network ports on an EX3200 switch with an SFP or SFP+ uplink module installed is disabled on page 195

Virtual Chassis port (VCP) connection does not work

Problem The Virtual Chassis port (VCP) connection configured in an EX4200 switch does not work.

A port of the uplink module is set as a VCP.

Cause The uplink module installed in the switch was replaced.

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Solution Set a port in the uplink module as a VCP. See Setting an Uplink Module Port as a Virtual Chassis Port (CLI Procedure).

One of the last four network ports on an EX3200 switch with an SFP or SFP+ uplink module installed is disabled

Problem One of the last four built-in ports (**ge-0/0/20** through **ge-0/0/23** on 24-port models or **ge-0/0/44** through **ge-0/0/47** on 48-port models) of an EX3200 switch with an SFP or SFP+ uplink module installed in it is disabled.

When you check the status with the CLI command **show interfaces ge-** or with the J-Web user interface, the disabled port is not listed.

Cause The last four built-in ports use the same ASIC as the SFP uplink module. Therefore, if you install a transceiver in an SFP or SFP+ uplink module installed in an EX3200 switch, a corresponding base port from the last four built-in ports is disabled.

Solution If you need to use the disabled built-in port, you must remove the transceiver from the SFP or SFP+ uplink module. Alternatively, you can install an XFP uplink module instead of an SFP or SFP+ uplink module. There is no conflict between the built-in network ports and the ports on the XFP uplink modules.

Related Topics

- Monitoring Interface Status and Traffic
- Configuring Gigabit Ethernet Interfaces (CLI Procedure)
- Configuring Gigabit Ethernet Interfaces (J-Web Procedure)
- Installing an Uplink Module in an EX3200 or EX4200 Switch on page 135
- Removing a Transceiver from an EX Series Switch on page 179
- Uplink Modules in EX3200 and EX4200 Switches on page 34
- Understanding Virtual Chassis Hardware Configuration on an EX4200 Switch on page 105

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PART 7

Returning Hardware

- Returning the Switch or Switch Components on page 199

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CHAPTER 16

Returning the Switch or Switch Components

- Returning an EX3200 or EX4200 Switch or Component for Repair or Replacement on page 199
- Locating the Serial Number on an EX3200 or EX4200 Switch or Component on page 200
- Contacting Customer Support to Obtain Return Materials Authorization for EX Series Switches on page 201
- Packing an EX3200 or EX4200 Switch or Component for Shipping on page 202

Returning an EX3200 or EX4200 Switch or Component for Repair or Replacement

If you need to return a switch or hardware component to Juniper Networks for repair or replacement, follow this procedure:

1. Determine the serial number of the component. For instructions, see "Locating the Serial Number on an EX3200 or EX4200 Switch or Component" on page 200.
2. Obtain an RMA number from JTAC as described in "Contacting Customer Support to Obtain Return Materials Authorization for EX Series Switches" on page 201.

NOTE: Do not return any component to Juniper Networks unless you have first obtained an RMA number. Juniper Networks reserves the right to refuse shipments that do not have an RMA. Refused shipments are returned to the customer through collect freight.

3. Pack the switch or component for shipping as described in "Packing an EX3200 or EX4200 Switch or Component for Shipping" on page 202.

For more information about return and repair policies, see the customer support page at http://www.juniper.net/support/guidelines.html.

Related Topics

- EX3200 and EX4200 Switches Hardware Overview on page 3

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Locating the Serial Number on an EX3200 or EX4200 Switch or Component

If you are returning a switch or hardware component to Juniper Networks for repair or replacement, you must locate the serial number of the switch or component. You must provide the serial number to the Juniper Networks Technical Assistance Center (JTAC) when you contact them to obtain Return Materials Authorization (RMA).

If the switch is operational and you can access the CLI, you can list serial numbers for the switch and for some components with a CLI command. If you do not have access to the CLI or if the serial number for the component does not appear in the command output, you can locate the serial number ID label on the physical switch or component (see Figure 74 on page 200 and Figure 75 on page 201).

NOTE: If you want to find the serial number on the physical switch component, you will need to remove the component from the switch chassis, for which you must have the required parts and tools available.

- Listing the Switch and Components Details with the CLI on page 200
- Locating the Chassis Serial Number ID Label on an EX3200 or EX4200 Switch on page 200
- Locating the Serial Number ID Labels on FRUs in an EX3200 or EX4200 Switch on page 201

Listing the Switch and Components Details with the CLI

To list the switch and switch components and their serial numbers, enter the following CLI command:

```
user@switch> show chassis hardware
Hardware inventory:
ItemVersion  Part number  Serial number     Description
Chassis    AL0207391164      EX3200-48T
FPC 0    REV X1   711-021265   AL0207391164      EX3200-48T, 8 POE
  CPUBUILTIN      BUILTIN   FPC CPU
  PIC 0  BUILTIN      BUILTIN   48x 10/100/1000 Base-T
Fan TrayFan Tray
```

Locating the Chassis Serial Number ID Label on an EX3200 or EX4200 Switch

EX3200 and EX4200 switches have serial number ID labels located on the rear panel of the chassis (see Figure 74 on page 200 and Figure 75 on page 201).

Figure 74: Location of the Serial Number ID Label on an EX3200 Switch

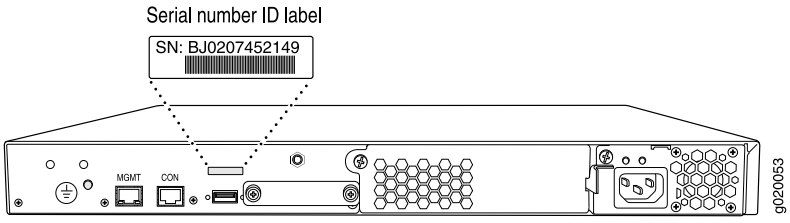

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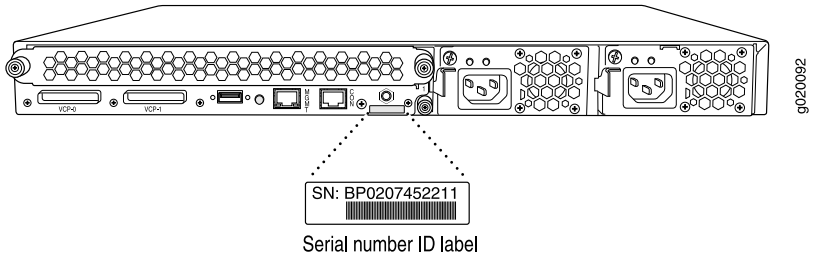
Figure 75: Location of the Serial Number ID Label on an EX4200 Switch



Locating the Serial Number ID Labels on FRUs in an EX3200 or EX4200 Switch

The power supplies, fan trays, and uplink modules installed in EX Series switches are field-replaceable units (FRUs).

For each of these FRUs, you must remove the FRU from the switch chassis to see the FRU's serial number ID label.

- **Power Supply**—The serial number ID label is on the top of the power supply. See "Removing a Power Supply from an EX3200 or EX4200 Switch" on page 174.
- **Fan tray**—The serial number ID label is on the back of the fan tray. See "Removing a Fan Tray from an EX3200 or EX4200 Switch" on page 176.
- **Uplink module**—The serial number ID label is on the circuit board. See "Removing an Uplink Module from an EX3200 or EX4200 Switch" on page 177.

Related Topics

- Contacting Customer Support to Obtain Return Materials Authorization for EX Series Switches on page 201
- Returning an EX3200 or EX4200 Switch or Component for Repair or Replacement on page 199

Contacting Customer Support to Obtain Return Materials Authorization for EX Series Switches

If you are returning a switch or hardware component to Juniper Networks for repair or replacement, obtain a Return Materials Authorization (RMA) from Juniper Networks Technical Assistance Center (JTAC).

After locating the serial number of the switch or hardware component you want to return, open a Case with Juniper Networks Technical Assistance Center (JTAC) on the Web or by telephone.

For instructions on locating the serial number of the switch or hardware component you want to return:

- See Locating the Serial Number on an EX2200 Switch or Component.
- See "Locating the Serial Number on an EX3200 or EX4200 Switch or Component" on page 200.

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- See Locating the Serial Number on an EX4500 Switch or Component.
- See Locating the Serial Number on an EX8200 Switch or Component.

Before you request an RMA from JTAC, be prepared to provide the following information:

- Your existing case number, if you have one
- Serial number of the component
- Your name, organization name, telephone number, fax number, and shipping address
- Details of the failure or problem
- Type of activity being performed on the switch when the problem occurred
- Configuration data displayed by one or more **show** commands

You can contact JTAC 24 hours a day, seven days a week on the Web or by telephone:

- Case Manager at CSC: http://www.juniper.net/cm/
- Telephone: +1-888-314-JTAC1-888-314-5822, toll free in U.S., Canada, and Mexico

NOTE: For international or direct-dial options in countries without toll free numbers, see http://www.juniper.net/support/requesting-support.html.

If you are contacting JTAC by telephone, enter your 11-digit case number followed by the pound (#) key for an existing case, or press the star (*) key to be routed to the next available support engineer.

The support representative validates your request and issues an RMA number for return of the component.

Related Topics

- Packing an EX2200 Switch or Component for Shipping
- Packing an EX3200 or EX4200 Switch or Component for Shipping on page 202
- Packing an EX4500 Switch or Component for Shipping
- Packing an EX8200 Switch or Component
- Returning an EX2200 Switch or Component for Repair or Replacement
- Returning an EX3200 or EX4200 Switch or Component for Repair or Replacement on page 199
- Returning an EX4500 Switch or Component for Repair or Replacement
- Returning an EX8200 Switch or Component for Repair or Replacement

Packing an EX3200 or EX4200 Switch or Component for Shipping

If you are returning an EX3200 or EX4200 switch or component to Juniper Networks for repair or replacement, pack the item as described in this topic.

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Before you begin packing the switch or component:

- Ensure that you have retrieved the original shipping carton and packing materials. Contact your JTAC representative if you do not have these materials, to learn about approved packing materials. See "Contacting Customer Support to Obtain Return Materials Authorization for EX Series Switches" on page 201.

Ensure that you have the following parts and tools available:

- Antistatic bag, one for each switch or component
- Phillips (+) screwdriver, number 2

This topic describes:

- Packing an EX3200 or EX4200 Switch for Shipping on page 203
- Packing EX3200 or EX4200 Switch Components for Shipping on page 204

Packing an EX3200 or EX4200 Switch for Shipping

To pack a switch for shipping:

1. On the console or other management device connected to the switch (to the master switch in a Virtual Chassis configuration), enter the CLI operational mode and issue the following command to shut down the switch software:

   ```
   user@switch> request system halt
   ```

   Wait until a message appears on the console confirming that the operating system has halted.

2. Disconnect power from the switch by performing one of the following:
   - If the power source outlet has a power switch, set it to the OFF (0) position.
   - If the power source outlet does not have a power switch, gently pull out the male end of the power cord connected to the power source outlet.
3. Remove the cables that connect the switch to all external devices. See "Disconnecting a Fiber-Optic Cable from an EX Series Switch" on page 181.
4. Remove all field-replaceable units (FRUs) from the switch.
5. If the switch is installed on a wall, rack, or cabinet, have one person support the weight of the switch while another person unscrews and removes the mounting screws.
6. Remove the switch from the wall, rack, cabinet, or desk (see "Chassis Lifting Guidelines for EX3200 and EX4200 Switches" on page 220) and place the switch in an antistatic bag.
7. Place the switch in the shipping carton.
8. Place the packing foam on top of and around the switch.
9. If you are returning accessories or FRUs with the switch, pack them as instructed in "Packing EX3200 or EX4200 Switch Components for Shipping" on page 204.

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10. Replace the accessory box on top of the packing foam.
11. Close the top of the cardboard shipping box and seal it with packing tape.
12. Write the RMA number on the exterior of the box to ensure proper tracking.

Packing EX3200 or EX4200 Switch Components for Shipping

CAUTION: Do not stack switch components. Return individual components in separate boxes if they do not fit together on one level in the shipping box.

To pack and ship switch components:

- Place individual boards in antistatic bags.
- Ensure that the components are adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.
- Close the top of the cardboard shipping box and seal it with packing tape.
- Write the RMA number on the exterior of the box to ensure proper tracking.

Related Topics

- Returning an EX3200 or EX4200 Switch or Component for Repair or Replacement on page 199
- Removing a Fan Tray from an EX3200 or EX4200 Switch on page 176
- Removing a Power Supply from an EX3200 or EX4200 Switch on page 174
- Removing an Uplink Module from an EX3200 or EX4200 Switch on page 177
- Removing a Transceiver from an EX Series Switch on page 179

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PART 8

Safety Information

- General Safety Information on page 207
- Radiation and Laser Warnings on page 213
- Installation and Maintenance Safety Information on page 219
- Power and Electrical Safety Information on page 235

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CHAPTER 17

General Safety Information

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Definitions of Safety Warning Levels for EX Series Switches on page 208
- Fire Safety Requirements for EX Series Switches on page 210
- Qualified Personnel Warning for EX Series Switches on page 211
- Warning Statement for Norway and Sweden for EX Series Switches on page 212

General Safety Guidelines and Warnings for EX Series Switches

The following guidelines help ensure your safety and protect the EX Series switch from damage. The list of guidelines might not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

- Perform only the procedures explicitly described in the hardware documentation for this product. Make sure that only authorized service personnel perform other system services.
- Keep the area around the chassis clear and free from dust before, during, and after installation.
- Keep tools away from areas where people could trip over them while walking.
- Do not wear loose clothing or jewelry, such as rings, bracelets, or chains, which could become caught in the chassis.
- Wear safety glasses if you are working under any conditions that could be hazardous to your eyes.
- Do not perform any actions that create a potential hazard to people or make the equipment unsafe.
- Never attempt to lift an object that is too heavy for one person to handle.
- Never install or manipulate wiring during electrical storms.
- Never install electrical jacks in wet locations unless the jacks are specifically designed for wet environments.
- Operate the EX Series switch only when it is properly grounded.
- Ensure that the separate protective earthing terminal provided on this product is permanently connected to earth.

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- Replace fuses only with fuses of the same type and rating.
- Do not open or remove chassis covers or sheet-metal parts unless instructions are provided in the hardware documentation for this product. Such an action could cause severe electrical shock.
- Do not push or force any objects through any opening in the chassis frame. Such an action could result in electrical shock or fire.
- Avoid spilling liquid onto the EX Series switch chassis or onto any switch component. Such an action could cause electrical shock or damage the switch.
- Avoid touching uninsulated electrical wires or terminals that have not been disconnected from their power source. Such an action could cause electrical shock.
- Always ensure that all modules, power supplies, and cover panels are fully inserted and that the installation screws are fully tightened.

Related Topics

- AC Power Electrical Safety Guidelines for EX Series Switches on page 238
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- Maintenance and Operational Safety Guidelines and Warnings for EX Series Switches on page 226
- Laser and LED Safety Guidelines and Warnings for EX Series Switches on page 213
- Installation Instructions Warning for EX Series Switches on page 219
- Grounded Equipment Warning for EX Series Switches on page 226

Definitions of Safety Warning Levels for EX Series Switches

The documentation for EX Series switches uses the following levels of safety warnings (there are two “Warning” formats):

NOTE: You might find this information helpful in a particular situation, or you might overlook this important information if it was not highlighted in a Note.

CAUTION: You need to observe the specified guidelines to avoid minor injury or discomfort to you or severe damage to the EX Series switch.

WARNING: This symbol alerts you to the risk of personal injury from a laser.

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WARNING: This symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

WARNING: **Waarschuwing** Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen.

WARNING: **Varoitus** Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista.

WARNING: **Attention** Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents.

WARNING: **Warnung** Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt.

WARNING: **Avvertenza** Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti.

WARNING: **Advarsel** Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker.

WARNING: **Aviso** Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer

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equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes.

WARNING: **¡Atención!** Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes.

WARNING: **Varning!** Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador.

Related Topics

- Warning Statement for Norway and Sweden for EX Series Switches on page 212
- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Installation Instructions Warning for EX Series Switches on page 219
- Maintenance and Operational Safety Guidelines and Warnings for EX Series Switches on page 226
- Grounded Equipment Warning for EX Series Switches on page 226
- Laser and LED Safety Guidelines and Warnings for EX Series Switches on page 213

Fire Safety Requirements for EX Series Switches

In the event of a fire emergency involving switches and other network equipment, the safety of people is the primary concern. You should establish procedures for protecting people in the event of a fire emergency, provide safety training, and properly provision fire-control equipment and fire extinguishers.

In addition, you should establish procedures to protect your equipment in the event of a fire emergency. Juniper Networks products should be installed in an environment suitable for electronic equipment. We recommend that fire suppression equipment be available in the event of a fire in the vicinity of the equipment and that all local fire, safety, and electrical codes and ordinances be observed when installing and operating your equipment.

Fire Suppression

In the event of an electrical hazard or an electrical fire, you should first turn power off to the equipment at the source. Then use a Type C fire extinguisher, which uses noncorrosive fire retardants, to extinguish the fire.

Fire Suppression Equipment

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Type C fire extinguishers, which use noncorrosive fire retardants such as carbon dioxide and Halotron™, are most effective for suppressing electrical fires. Type C fire extinguishers displace oxygen from the point of combustion to eliminate the fire. For extinguishing fire on or around equipment that draws air from the environment for cooling, you should use this type of inert oxygen displacement extinguisher instead of an extinguisher that leaves residues on equipment.

Do not use multipurpose Type ABC chemical fire extinguishers (dry chemical fire extinguishers). The primary ingredient in these fire extinguishers is monoammonium phosphate, which is very sticky and difficult to clean. In addition, in the presence of minute amounts of moisture, monoammonium phosphate can become highly corrosive and corrodes most metals.

Any equipment in a room in which a chemical fire extinguisher has been discharged is subject to premature failure and unreliable operation. The equipment is considered to be irreparably damaged.

NOTE: To keep warranties effective, do not use a dry chemical fire extinguisher to control a fire at or near a Juniper Networks switch. If a dry chemical fire extinguisher is used, the unit is no longer eligible for coverage under a service agreement.

We recommend that you dispose of any irreparably damaged equipment in an environmentally responsible manner.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- In Case of Electrical Accident: Action to Take on an EX Series Switch on page 248

Qualified Personnel Warning for EX Series Switches

WARNING: Only trained and qualified personnel should install or replace the EX Series switch.

Waarschuwing Installatie en reparaties mogen uitsluitend door getraind en bevoegd personeel uitgevoerd worden.

Varoitus Ainoastaan koulutettu ja pätevä henkilökunta saa asentaa tai vaihtaa tämän laitteen.

Attention Tout installation ou remplacement de l'appareil doit être réalisé par du personnel qualifié et compétent.

Warnung Gerät nur von geschultem, qualifiziertem Personal installieren oder auswechseln lassen.

Avvertenza Solo personale addestrato e qualificato deve essere autorizzato ad installare o sostituire questo apparecchio.

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Advarsel Kun kvalifisert personell med riktig opplæring bør montere eller bytte ut dette utstyret.

Aviso Este equipamento deverá ser instalado ou substituído apenas por pessoal devidamente treinado e qualificado.

¡Atención! Estos equipos deben ser instalados y reemplazados exclusivamente por personal técnico adecuadamente preparado y capacitado.

Varning! Denna utrustning ska endast installeras och bytas ut av utbildad och kvalificerad personal.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- AC Power Electrical Safety Guidelines for EX Series Switches on page 238
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240

Warning Statement for Norway and Sweden for EX Series Switches

WARNING: The equipment must be connected to an earthed mains socket-outlet.

Advarsel Apparatet skal kobles til en jordet stikkontakt.

Varning! Apparaten skall anslutas till jordat nätuttag.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207

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CHAPTER 18

Radiation and Laser Warnings

- Laser and LED Safety Guidelines and Warnings for EX Series Switches on page 213
- Radiation from Open Port Apertures Warning for EX Series Switches on page 216

Laser and LED Safety Guidelines and Warnings for EX Series Switches

EX Series switches are equipped with laser transmitters, which are considered a Class 1 Laser Product by the U.S. Food and Drug Administration and are evaluated as a Class 1 Laser Product per EN 60825–1 requirements.

Observe the following guidelines and warnings:

- General Laser Safety Guidelines on page 213
- Class 1 Laser Product Warning on page 213
- Class 1 LED Product Warning on page 214
- Laser Beam Warning on page 214

General Laser Safety Guidelines

When working around ports that support optical transceivers, observe the following safety guidelines to prevent eye injury:

- Do not look into unterminated ports or at fibers that connect to unknown sources.
- Do not examine unterminated optical ports with optical instruments.
- Avoid direct exposure to the beam.

WARNING: Unterminated optical connectors can emit invisible laser radiation. The lens in the human eye focuses all the laser power on the retina, so focusing the eye directly on a laser source—even a low-power laser—could permanently damage the eye.

Class 1 Laser Product Warning

WARNING: Class 1 laser product.

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Waarschuwing Klasse-1 laser produkt.

Varoitus Luokan 1 lasertuote.

Attention Produit laser de classe I.

Warnung Laserprodukt der Klasse 1.

WARNING: **Avvertenza** Prodotto laser di Classe 1.
Advarsel Laserprodukt av klasse 1.

Aviso Produto laser de classe 1.

¡Atención! Producto láser Clase I.

Varning! Laserprodukt av klass 1.

Class 1 LED Product Warning

WARNING: Class 1 LED product.
Waarschuwing Klasse 1 LED-product.

Varoitus Luokan 1 valodiodituote.

Attention Alarme de produit LED Class I.

Warnung Class 1 LED-Produktwarnung.

WARNING: **Avvertenza** Avvertenza prodotto LED di Classe 1.
Advarsel LED-produkt i klasse 1.

Aviso Produto de classe 1 com LED.

¡Atención! Aviso sobre producto LED de Clase 1.

Varning! Lysdiodprodukt av klass 1.

Laser Beam Warning

WARNING: Do not stare into the laser beam or view it directly with optical instruments.

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WARNING: **Waarschuwing** Niet in de straal staren of hem rechtstreeks bekijken met optische instrumenten.

WARNING: **Varoitus** Älä katso säteeseen äläkä tarkastele sitä suoraan optisen laitteen avulla.

WARNING: **Attention** Ne pas fixer le faisceau des yeux, ni l'observer directement à l'aide d'instruments optiques.

WARNING: **Warnung** Nicht direkt in den Strahl blicken und ihn nicht direkt mit optischen Geräten prüfen.

WARNING: **Avvertenza** Non fissare il raggio con gli occhi né usare strumenti ottici per osservarlo direttamente.

WARNING: **Advarsel** Stirr eller se ikke direkte p strlen med optiske instrumenter.

WARNING: **Aviso** Não olhe fixamente para o raio, nem olhe para ele directamente com instrumentos ópticos.

WARNING: **¡Atención!** No mirar fijamente el haz ni observarlo directamente con instrumentos ópticos.

WARNING: **Varning!** Rikta inte blicken in mot strålen och titta inte direkt på den genom optiska instrument.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Radiation from Open Port Apertures Warning for EX Series Switches on page 216
- Installation Instructions Warning for EX Series Switches on page 219
- Grounded Equipment Warning for EX Series Switches on page 226
- Optical Interface Support in EX2200 Switches
- Optical Interface Support in EX3200 and EX4200 Switches on page 43
- Optical Interface Support in EX4500 Switches

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- Optical Interface Support in EX8200 Switches

Radiation from Open Port Apertures Warning for EX Series Switches

WARNING: Because invisible radiation might be emitted from the aperture of the port when no fiber cable is connected, avoid exposure to radiation and do not stare into open apertures.

WARNING: **Waarschuwing** Aangezien onzichtbare straling vanuit de opening van de poort kan komen als er geen fiberkabel aangesloten is, dient blootstelling aan straling en het kijken in open openingen vermeden te worden.

WARNING: **Varoitus** Koska portin aukosta voi emittoitua näkymätöntä säteilyä, kun kuitukaapelia ei ole kytkettynä, vältä säteilylle altistumista äläkä katso avoimiin aukkoihin.

WARNING: **Attention** Des radiations invisibles à l'il nu pouvant traverser l'ouverture du port lorsqu'aucun câble en fibre optique n'y est connecté, il est recommandé de ne pas regarder fixement l'intérieur de ces ouvertures.

WARNING: **Warnung** Aus der Port-Öffnung können unsichtbare Strahlen emittieren, wenn kein Glasfaserkabel angeschlossen ist. Vermeiden Sie es, sich den Strahlungen auszusetzen, und starren Sie nicht in die Öffnungen!

WARNING: **Avvertenza** Quando i cavi in fibra non sono inseriti, radiazioni invisibili possono essere emesse attraverso l'apertura della porta. Evitate di esporvi alle radiazioni e non guardate direttamente nelle aperture.

WARNING: **Advarsel** Unngå utsettelse for stråling, og stirr ikke inn i åpninger som er åpne, fordi usynlig stråling kan emiteres fra portens åpning når det ikke er tilkoblet en fiberkabel.

WARNING: **Aviso** Dada a possibilidade de emissão de radiação invisível através do orifício da via de acesso, quando esta não tiver nenhum cabo de fibra conectado, deverá evitar a exposição à radiação e não deverá olhar fixamente para orifícios que se encontrarem a descoberto.

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WARNING: **¡Atención!** Debido a que la apertura del puerto puede emitir radiación invisible cuando no existe un cable de fibra conectado, evite mirar directamente a las aperturas para no exponerse a la radiación.

WARNING: **Varning!** Osynlig strålning kan avges från en portöppning utan ansluten fiberkabel och du bör därför undvika att bli utsatt för strålning genom att inte stirra in i oskyddade öppningar.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Laser and LED Safety Guidelines and Warnings for EX Series Switches on page 213
- Installation Instructions Warning for EX Series Switches on page 219
- Grounded Equipment Warning for EX Series Switches on page 226

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CHAPTER 19

Installation and Maintenance Safety Information

- Installation Instructions Warning for EX Series Switches on page 219
- Chassis Lifting Guidelines for EX3200 and EX4200 Switches on page 220
- Ramp Warning for EX Series Switches on page 220
- Rack-Mounting and Cabinet-Mounting Warnings for EX Series Switches on page 221
- Wall-Mounting Warning for EX3200 and EX4200 Switches on page 225
- Grounded Equipment Warning for EX Series Switches on page 226
- Maintenance and Operational Safety Guidelines and Warnings for EX Series Switches on page 226

Installation Instructions Warning for EX Series Switches

WARNING: Read the installation instructions before you connect the switch to a power source.

Waarschuwing Raadpleeg de installatie-aanwijzingen voordat u het systeem met de voeding verbindt.

Varoitus Lue asennusohjeet ennen järjestelmän yhdistämistä virtalähteeseen.

Attention Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

Warnung Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.

Avvertenza Consultare le istruzioni di installazione prima di collegare il sistema all'alimentatore.

Advarsel Les installasjonsinstruksjonene før systemet kobles til strømkilden.

Aviso Leia as instruções de instalação antes de ligar o sistema à sua fonte de energia.

¡Atención! Ver las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

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Varning! Läs installationsanvisningarna innan du kopplar systemet till dess strömförsörjningsenhet.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Laser and LED Safety Guidelines and Warnings for EX Series Switches on page 213
- Grounded Equipment Warning for EX Series Switches on page 226
- Connecting AC Power to an EX2200 Switch
- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting AC Power to an EX4500 Switch
- Connecting AC Power to an EX8200 Switch
- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Connecting DC Power to an EX8200 Switch

Chassis Lifting Guidelines for EX3200 and EX4200 Switches

The weight of a fully loaded EX3200 or EX4200 switch chassis is approximately 22 lb (10 kg). Observe the following guidelines for lifting and moving an EX3200 or EX4200 switch:

- Before installing an EX3200 or EX4200 switch, read the guidelines in "Site Preparation Checklist for EX3200 and EX4200 Switches" on page 87 to verify that the intended site meets the specified power, environmental, and clearance requirements.
- Before lifting or moving the EX3200 or EX4200 switch, disconnect all external cables.
- As when lifting any heavy object, lift most of the weight with your legs rather than your back. Keep your knees bent and your back relatively straight and avoid twisting your body as you lift. Balance the load evenly and be sure that your footing is solid.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Installation Instructions Warning for EX Series Switches on page 219
- Mounting an EX3200 or EX4200 Switch on page 120

Ramp Warning for EX Series Switches

WARNING: When installing the switch, do not use a ramp inclined at more than 10 degrees.

Waarschuwing Gebruik een oprijplaat niet onder een hoek van meer dan 10 graden.

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Varoitus Älä käytä sellaista kaltevaa pintaa, jonka kaltevuus ylittää 10 astetta.

Attention Ne pas utiliser une rampe dont l'inclinaison est supérieure à 10 degrés.

Warnung Keine Rampen mit einer Neigung von mehr als 10 Grad verwenden.

Avvertenza Non usare una rampa con pendenza superiore a 10 gradi.

Advarsel Bruk aldri en rampe som heller mer enn 10 grader.

Aviso Não utilize uma rampa com uma inclinação superior a 10 graus.

¡Atención! No usar una rampa inclinada más de 10 grados

Varning! Använd inte ramp med en lutning på mer än 10 grader.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Laser and LED Safety Guidelines and Warnings for EX Series Switches on page 213
- Installation Instructions Warning for EX Series Switches on page 219
- Grounded Equipment Warning for EX Series Switches on page 226

Rack-Mounting and Cabinet-Mounting Warnings for EX Series Switches

Ensure that the rack or cabinet in which the EX Series switch is installed is evenly and securely supported. Uneven mechanical loading could lead to a hazardous condition.

WARNING: To prevent bodily injury when mounting or servicing the switch in a rack, take the following precautions to ensure that the system remains stable. The following directives help maintain your safety:

- The switch must be installed in a rack that is secured to the building structure.
- The switch should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting the switch on a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the switch in the rack.

WARNING: **Waarschuwing** Om lichamelijk letsel te voorkomen wanneer u dit toestel in een rek monteert of het daar een servicebeurt geeft, moet u speciale

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voorzorgsmaatregelen nemen om ervoor te zorgen dat het toestel stabiel blijft. De onderstaande richtlijnen worden verstrekt om uw veiligheid te verzekeren:

- De Juniper Networks switch moet in een stellage worden geïnstalleerd die aan een bouwsel is verankerd.
- Dit toestel dient onderaan in het rek gemonteerd te worden als het toestel het enige in het rek is.
- Wanneer u dit toestel in een gedeeltelijk gevuld rek monteert, dient u het rek van onderen naar boven te laden met het zwaarste onderdeel onderaan in het rek.
- Als het rek voorzien is van stabiliseringshulpmiddelen, dient u de stabilisatoren te monteren voordat u het toestel in het rek monteert of het daar een servicebeurt geeft.

WARNING: **Varoitus** Kun laite asetetaan telineeseen tai huolletaan sen ollessa telineessä, on noudatettava erityisiä varotoimia järjestelmän vakavuuden säilyttämiseksi, jotta vältytään loukkaantumiselta. Noudata seuraavia turvallisuusohjeita:

- Juniper Networks switch on asennettava telineeseen, joka on kiinnitetty rakennukseen.
- Jos telineessä ei ole muita laitteita, aseta laite telineen alaosaan.
- Jos laite asetetaan osaksi täytettyyn telineeseen, aloita kuormittaminen sen alaosasta kaikkein raskaimmalla esineellä ja siirry sitten sen yläosaan.
- Jos telinettä varten on vakaimet, asenna ne ennen laitteen asettamista telineeseen tai sen huoltamista siinä.

WARNING: **Attention** Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel:

- Le rack sur lequel est monté le Juniper Networks switch doit être fixé à la structure du bâtiment.
- Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas.
- Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas.
- Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.

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WARNING: **Warnung** Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:

- Der Juniper Networks switch muß in einem Gestell installiert werden, das in der Gebäudestruktur verankert ist.
- Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden.
- Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist.
- Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.

WARNING: **Avvertenza** Per evitare infortuni fisici durante il montaggio o la manutenzione di questa unità in un supporto, occorre osservare speciali precauzioni per garantire che il sistema rimanga stabile. Le seguenti direttive vengono fornite per garantire la sicurezza personale:

- Il Juniper Networks switch deve essere installato in un telaio, il quale deve essere fissato alla struttura dell'edificio.
- Questa unità deve venire montata sul fondo del supporto, se si tratta dell'unica unità da montare nel supporto.
- Quando questa unità viene montata in un supporto parzialmente pieno, caricare il supporto dal basso all'alto, con il componente più pesante sistemato sul fondo del supporto.
- Se il supporto è dotato di dispositivi stabilizzanti, installare tali dispositivi prima di montare o di procedere alla manutenzione dell'unità nel supporto.

WARNING: **Advarsel** Unngå fysiske skader under montering eller reparasjonsarbeid på denne enheten når den befinner seg i et kabinett. Vær nøye med at systemet er stabilt. Følgende retningslinjer er gitt for å verne om sikkerheten:

- Juniper Networks switch må installeres i et stativ som er forankret til bygningsstrukturen.
- Denne enheten bør monteres nederst i kabinettet hvis dette er den eneste enheten i kabinettet.

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- Ved montering av denne enheten i et kabinett som er delvis fylt, skal kabinettet lastes fra bunnen og opp med den tyngste komponenten nederst i kabinettet.
- Hvis kabinettet er utstyrt med stabiliseringsutstyr, skal stabilisatorene installeres før montering eller utføring av reparasjonsarbeid på enheten i kabinettet.

WARNING: **Aviso** Para se prevenir contra danos corporais ao montar ou reparar esta unidade numa estante, deverá tomar precauções especiais para se certificar de que o sistema possui um suporte estável. As seguintes directrizes ajudá-lo-ão a efectuar o seu trabalho com segurança:

- O Juniper Networks switch deverá ser instalado numa prateleira fixa à estrutura do edificio.
- Esta unidade deverá ser montada na parte inferior da estante, caso seja esta a única unidade a ser montada.
- Ao montar esta unidade numa estante parcialmente ocupada, coloque os itens mais pesados na parte inferior da estante, arrumando-os de baixo para cima.
- Se a estante possuir um dispositivo de estabilização, instale-o antes de montar ou reparar a unidade.

WARNING: **¡Atención!** Para evitar lesiones durante el montaje de este equipo sobre un bastidor, o posteriormente durante su mantenimiento, se debe poner mucho cuidado en que el sistema quede bien estable. Para garantizar su seguridad, proceda según las siguientes instrucciones:

- El Juniper Networks switch debe instalarse en un bastidor fijado a la estructura del edificio.
- Colocar el equipo en la parte inferior del bastidor, cuando sea la única unidad en el mismo.
- Cuando este equipo se vaya a instalar en un bastidor parcialmente ocupado, comenzar la instalación desde la parte inferior hacia la superior colocando el equipo más pesado en la parte inferior.
- Si el bastidor dispone de dispositivos estabilizadores, instalar éstos antes de montar o proceder al mantenimiento del equipo instalado en el bastidor.

WARNING: **Varning!** För att undvika kroppsskada när du installerar eller utför underhållsarbete på denna enhet på en ställning måste du vidta särskilda

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försiktighetsåtgärder för att försäkra dig om att systemet står stadigt. Följande riktlinjer ges för att trygga din säkerhet:

- Juniper Networks switch måste installeras i en ställning som är förankrad i byggnadens struktur.
- Om denna enhet är den enda enheten på ställningen skall den installeras längst ned på ställningen.
- Om denna enhet installeras på en delvis fylld ställning skall ställningen fyllas nedifrån och upp, med de tyngsta enheterna längst ned på ställningen.
- Om ställningen är försedd med stabiliseringsdon skall dessa monteras fast innan enheten installeras eller underhålls på ställningen.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Installation Instructions Warning for EX Series Switches on page 219
- Grounded Equipment Warning for EX Series Switches on page 226
- Mounting an EX2200 Switch
- Mounting an EX3200 or EX4200 Switch on page 120
- Mounting an EX4500 Switch
- Mounting an EX8208 Switch on a Rack or Cabinet
- Mounting an EX8216 Switch on a Rack or Cabinet

Wall-Mounting Warning for EX3200 and EX4200 Switches

WARNING: When mounted in a vertical position, an EX3200 or EX4200 chassis must be oriented with the front panel of the chassis pointing down to ensure proper airflow and meet safety requirements in the event of a fire.

WARNING: Avertissement: lorsqu'installé en position verticale, un châssis de commutation EX3200 ou EX4200 doit être orienté avec le panneau avant dirigé vers le bas.

WARNING: Warnhinweis: Bei der Befestigung in vertikaler Position muss ein EX3200- oder EX4200-Switch-Gehäuse so ausgerichtet werden, dass das vordere Bedienfeld des Switch-Gehäuses nach unten zeigt.

Related Topics

- Mounting an EX3200 or EX4200 Switch on a Wall on page 128

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Grounded Equipment Warning for EX Series Switches

WARNING: The switch is intended to be grounded. During normal use, ensure that you have connected earth ground to the switch chassis.

Waarschuwing Deze apparatuur hoort geaard te worden Zorg dat de host-computer tijdens normaal gebruik met aarde is verbonden.

Varoitus Tämä laitteisto on tarkoitettu maadoitettavaksi. Varmista, että isäntälaite on yhdistetty maahan normaalikäytön aikana.

Attention Cet équipement doit être relié à la terre. S'assurer que l'appareil hôte est relié à la terre lors de l'utilisation normale.

Warnung Dieses Gerät muß geerdet werden. Stellen Sie sicher, daß das Host-Gerät während des normalen Betriebs an Erde gelegt ist.

Avvertenza Questa apparecchiatura deve essere collegata a massa. Accertarsi che il dispositivo host sia collegato alla massa di terra durante il normale utilizzo.

Advarsel Dette utstyret skal jordes. Forviss deg om vertsterminalen er jordet ved normalt bruk.

Aviso Este equipamento deverá estar ligado à terra. Certifique-se que o host se encontra ligado à terra durante a sua utilização normal.

¡Atención! Este equipo debe conectarse a tierra. Asegurarse de que el equipo principal esté conectado a tierra durante el uso normal.

Varning! Denna utrustning är avsedd att jordas. Se till att värdenheten är jordad vid normal användning.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- Connecting Earth Ground to an EX Series Switch on page 141

Maintenance and Operational Safety Guidelines and Warnings for EX Series Switches

While performing the maintenance activities for EX Series switches, observe the following guidelines and warnings:

- Battery Handling Warning on page 227
- Jewelry Removal Warning on page 228
- Lightning Activity Warning on page 229
- Operating Temperature Warning on page 230
- Product Disposal Warning on page 232

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Battery Handling Warning

WARNING: Replacing a battery incorrectly might result in an explosion. Replace a battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

WARNING: **Waarschuwing** Er is ontploffingsgevaar als de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type dat door de fabrikant aanbevolen is. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften weggeworpen te worden.

WARNING: **Varoitus** Räjähdyksen vaara, jos akku on vaihdettu väärään akkuun. Käytä vaihtamiseen ainoastaan saman- tai vastaavantyyppistä akkua, joka on valmistajan suosittelema. Hävitä käytetyt akut valmistajan ohjeiden mukaan.

WARNING: **Attention** Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

WARNING: **Warnung** Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

WARNING: **Advarsel** Det kan være fare for eksplosjon hvis batteriet skiftes på feil måte. Skift kun med samme eller tilsvarende type som er anbefalt av produsenten. Kasser brukte batterier i henhold til produsentens instruksjoner.

WARNING: **Avvertenza** Pericolo di esplosione se la batteria non è installata correttamente. Sostituire solo con una di tipo uguale o equivalente, consigliata dal produttore. Eliminare le batterie usate secondo le istruzioni del produttore.

WARNING: **Aviso** Existe perigo de explosão se a bateria for substituída incorrectamente. Substitua a bateria por uma bateria igual ou de um tipo equivalente recomendado pelo fabricante. Destrua as baterias usadas conforme as instruções do fabricante.

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WARNING: **¡Atención!** Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

WARNING: **Varning!** Explosionsfara vid felaktigt batteribyte. Ersätt endast batteriet med samma batterityp som rekommenderas av tillverkaren eller motsvarande. Följ tillverkarens anvisningar vid kassering av använda batterier.

Jewelry Removal Warning

WARNING: Before working on equipment that is connected to power lines, remove jewelry, including rings, necklaces, and watches. Metal objects heat up when connected to power and ground and can cause serious burns or can be welded to the terminals.

WARNING: **Waarschuwing** Alvorens aan apparatuur te werken die met elektrische leidingen is verbonden, sieraden (inclusief ringen, kettingen en horloges) verwijderen. Metalen voorwerpen worden warm wanneer ze met stroom en aarde zijn verbonden, en kunnen ernstige brandwonden veroorzaken of het metalen voorwerp aan de aansluitklemmen lassen.

WARNING: **Varoitus** Ennen kuin työskentelet voimavirtajohtoihin kytkettyjen laitteiden parissa, ota pois kaikki korut (sormukset, kaulakorut ja kellot mukaan lukien). Metalliesineet kuumenevat, kun ne ovat yhteydessä sähkövirran ja maan kanssa, ja ne voivat aiheuttaa vakavia palovammoja tai hitsata metalliesineet kiinni liitäntänapoihin.

WARNING: **Attention** Avant d'accéder à cet équipement connecté aux lignes électriques, ôter tout bijou (anneaux, colliers et montres compris). Lorsqu'ils sont branchés à l'alimentation et reliés à la terre, les objets métalliques chauffent, ce qui peut provoquer des blessures graves ou souder l'objet métallique aux bornes.

WARNING: **Warnung** Vor der Arbeit an Geräten, die an das Netz angeschlossen sind, jeglichen Schmuck (einschließlich Ringe, Ketten und Uhren) abnehmen. Metallgegenstände erhitzen sich, wenn sie an das Netz und die Erde angeschlossen werden, und können schwere Verbrennungen verursachen oder an die Anschlußklemmen angeschweißt werden.

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WARNING: **Avvertenza** Prima di intervenire su apparecchiature collegate alle linee di alimentazione, togliersi qualsiasi monile (inclusi anelli, collane, braccialetti ed orologi). Gli oggetti metallici si riscaldano quando sono collegati tra punti di alimentazione e massa: possono causare ustioni gravi oppure il metallo può saldarsi ai terminali.

WARNING: **Advarsel** Fjern alle smykker (inkludert ringer, halskjeder og klokker) før du skal arbeide på utstyr som er koblet til kraftledninger. Metallgjenstander som er koblet til kraftledninger og jord blir svært varme og kan forårsake alvorlige brannskader eller smelte fast til polene.

WARNING: **Aviso** Antes de trabalhar em equipamento que esteja ligado a linhas de corrente, retire todas as jóias que estiver a usar (incluindo anéis, fios e relógios). Os objectos metálicos aquecerão em contacto com a corrente e em contacto com a ligação à terra, podendo causar queimaduras graves ou ficarem soldados aos terminais.

WARNING: **¡Atención!** Antes de operar sobre equipos conectados a líneas de alimentación, quitarse las joyas (incluidos anillos, collares y relojes). Los objetos de metal se calientan cuando se conectan a la alimentación y a tierra, lo que puede ocasionar quemaduras graves o que los objetos metálicos queden soldados a los bornes.

WARNING: **Varning!** Tag av alla smycken (inklusive ringar, halsband och armbandsur) innan du arbetar på utrustning som är kopplad till kraftledningar. Metallobjekt hettas upp när de kopplas ihop med ström och jord och kan förorsaka allvarliga brännskador; metallobjekt kan också sammansvetsas med kontakterna.

Lightning Activity Warning

WARNING: Do not work on the system or connect or disconnect cables during periods of lightning activity.

WARNING: **Waarschuwing** Tijdens onweer dat gepaard gaat met bliksem, dient u niet aan het systeem te werken of kabels aan te sluiten of te ontkoppelen.

WARNING: **Varoitus** Älä työskentele järjestelmän parissa äläkä yhdistä tai irrota kaapeleita ukkosilmalla.

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WARNING: **Attention** Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.

WARNING: **Warnung** Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.

WARNING: **Avvertenza** Non lavorare sul sistema o collegare oppure scollegare i cavi durante un temporale con fulmini.

WARNING: **Advarsel** Utfør aldri arbeid på systemet, eller koble kabler til eller fra systemet når det tordner eller lyner.

WARNING: **Aviso** Não trabalhe no sistema ou ligue e desligue cabos durante períodos de mau tempo (trovoada).

WARNING: **¡Atención!** No operar el sistema ni conectar o desconectar cables durante el transcurso de descargas eléctricas en la atmósfera.

WARNING: **Varning!** Vid åska skall du aldrig utföra arbete på systemet eller ansluta eller koppla loss kablar.

Operating Temperature Warning

WARNING: To prevent the switch from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 104° F (40° C). To prevent airflow restriction, allow at least 6 in. (15.2 cm) of clearance around the ventilation openings.

WARNING: **Waarschuwing** Om te voorkomen dat welke switch van de Juniper Networks router dan ook oververhit raakt, dient u deze niet te bedienen op een plaats waar de maximale aanbevolen omgevingstemperatuur van 40° C wordt overschreden. Om te voorkomen dat de luchtstroom wordt beperkt, dient er minstens 15,2 cm speling rond de ventilatie-openingen te zijn.

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WARNING: **Varoitus** Ettei Juniper Networks switch-sarjan reititin ylikuumentuisi, sitä ei saa käyttää tilassa, jonka lämpötila ylittää korkeimman suositellun ympäristölämpötilan 40° C. Ettei ilmanvaihto estyisi, tuuletusaukkojen ympärille on jätettävä ainakin 15,2 cm tilaa.

WARNING: **Attention** Pour éviter toute surchauffe des routeurs de la gamme Juniper Networks switch, ne l'utilisez pas dans une zone où la température ambiante est supérieure à 40° C. Pour permettre un flot d'air constant, dégagez un espace d'au moins 15,2 cm autour des ouvertures de ventilations.

WARNING: **Warnung** Um einen Router der switch vor Überhitzung zu schützen, darf dieser nicht in einer Gegend betrieben werden, in der die Umgebungstemperatur das empfohlene Maximum von 40° C überschreitet. Um Lüftungsverschluß zu verhindern, achten Sie darauf, daß mindestens 15,2 cm lichter Raum um die Lüftungsöffnungen herum frei bleibt.

WARNING: **Avvertenza** Per evitare il surriscaldamento dei switch, non adoperateli in un locale che ecceda la temperatura ambientale massima di 40° C. Per evitare che la circolazione dell'aria sia impedita, lasciate uno spazio di almeno 15.2 cm di fronte alle aperture delle ventole.

WARNING: **Advarsel** Unngå overoppheting av eventuelle rutere i Juniper Networks switch Disse skal ikke brukes på steder der den anbefalte maksimale omgivelsestemperaturen overstiger 40° C (104° F). Sørg for at klaringen rundt lufteåpningene er minst 15,2 cm (6 tommer) for å forhindre nedsatt luftsirkulasjon.

WARNING: **Aviso** Para evitar o sobreaquecimento do encaminhador Juniper Networks switch, não utilize este equipamento numa área que exceda a temperatura máxima recomendada de 40° C. Para evitar a restrição à circulação de ar, deixe pelo menos um espaço de 15,2 cm à volta das aberturas de ventilação.

WARNING: **¡Atención!** Para impedir que un encaminador de la serie Juniper Networks switch se recaliente, no lo haga funcionar en un área en la que se supere la temperatura ambiente máxima recomendada de 40° C. Para impedir la restricción de la entrada de aire, deje un espacio mínimo de 15,2 cm alrededor de las aperturas para ventilación.

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WARNING: **Varning!** Förhindra att en Juniper Networks switch överhettas genom att inte använda den i ett område där den maximalt rekommenderade omgivningstemperaturen på 40° C överskrids. Förhindra att luftcirkulationen inskränks genom att se till att det finns fritt utrymme på minst 15,2 cm omkring ventilationsöppningarna.

Product Disposal Warning

WARNING: Disposal of this product must be handled according to all national laws and regulations.

WARNING: **Waarschuwing** Dit produkt dient volgens alle landelijke wetten en voorschriften te worden afgedankt.

WARNING: **Varoitus** Tämän tuotteen lopullisesta hävittämisestä tulee huolehtia kaikkia valtakunnallisia lakeja ja säännöksiä noudattaen.

WARNING: **Attention** La mise au rebut définitive de ce produit doit être effectuée conformément à toutes les lois et réglementations en vigueur.

WARNING: **Warnung** Dieses Produkt muß den geltenden Gesetzen und Vorschriften entsprechend entsorgt werden.

WARNING: **Avvertenza** L'eliminazione finale di questo prodotto deve essere eseguita osservando le normative italiane vigenti in materia

WARNING: **Advarsel** Endelig disponering av dette produktet må skje i henhold til nasjonale lover og forskrifter.

WARNING: **Aviso** A descartagem final deste produto deverá ser efectuada de acordo com os regulamentos e a legislação nacional.

WARNING: **¡Atención!** El desecho final de este producto debe realizarse según todas las leyes y regulaciones nacionales

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WARNING: **Varning!** Slutlig kassering av denna produkt bör skötas i enlighet med landets alla lagar och föreskrifter.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- AC Power Electrical Safety Guidelines for EX Series Switches on page 238
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240
- Laser and LED Safety Guidelines and Warnings for EX Series Switches on page 213
- Installation Instructions Warning for EX Series Switches on page 219
- Grounded Equipment Warning for EX Series Switches on page 226

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CHAPTER 20

Power and Electrical Safety Information

- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- Prevention of Electrostatic Discharge Damage on EX Series Switches on page 236
- AC Power Electrical Safety Guidelines for EX Series Switches on page 238
- AC Power Disconnection Warning for EX Series Switches on page 239
- Multiple Power Supplies Disconnection Warning for EX Series Switches on page 240
- Power Sources for Redundant Power Supplies Warning for EX4200 Switches on page 240
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240
- DC Power Disconnection Warning for EX Series Switches on page 242
- DC Power Grounding Requirements and Warning for EX Series Switches on page 243
- DC Power Wiring Sequence Warning for EX Series Switches on page 244
- DC Power Wiring Terminations Warning for EX Series Switches on page 246
- TN Power Warning for EX Series Switches on page 247
- In Case of Electrical Accident: Action to Take on an EX Series Switch on page 248

General Electrical Safety Guidelines and Warnings for EX Series Switches

WARNING: Certain ports on the switch are designed for use as intrabuilding (within-the-building) interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed outside plant (OSP) cabling. To comply with NEBS requirements and protect against lightning surges and commercial power disturbances, the intrabuilding ports *must not* be metallically connected to interfaces that connect to the OSP or its wiring. The intrabuilding ports on the switch are suitable for connection to intrabuilding or unexposed wiring or cabling only. The addition of primary protectors is not sufficient protection for connecting these interfaces metallically to OSP wiring.

CAUTION: Before removing or installing components of a switch, attach an ESD strap to an ESD point and place the other end of the strap around your bare wrist. Failure to use an ESD strap could result in damage to the switch.

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- Install the EX Series switch in compliance with the following local, national, and international electrical codes:
  - United States—National Fire Protection Association (NFPA 70), United States National Electrical Code.
  - Other countries—International Electromechanical Commission (IEC) 60364, Part 1 through Part 7.
  - Evaluated to the TN power system.
  - Canada—Canadian Electrical Code, Part 1, CSA C22.1.
- Locate the emergency power-off switch for the room in which you are working so that if an electrical accident occurs, you can quickly turn off the power.
- Make sure that grounding surfaces are cleaned and brought to a bright finish before grounding connections are made.
- Do not work alone if potentially hazardous conditions exist anywhere in your workspace.
- Never assume that power is disconnected from a circuit. Always check the circuit before starting to work.
- Carefully look for possible hazards in your work area, such as moist floors, ungrounded power extension cords, and missing safety grounds.
- Operate the EX Series switch within marked electrical ratings and product usage instructions.
- To ensure that the EX Series switch and peripheral equipment function safely and correctly, use the cables and connectors specified for the attached peripheral equipment, and make certain they are in good condition.

You can remove and replace many switch components without powering off or disconnecting power to the switch, as detailed elsewhere in the hardware documentation for this product. Never install equipment if it appears damaged.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- AC Power Electrical Safety Guidelines for EX Series Switches on page 238
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240

Prevention of Electrostatic Discharge Damage on EX Series Switches

Switch components that are shipped in antistatic bags are sensitive to damage from static electricity. Some components can be impaired by voltages as low as 30 V. You can easily generate potentially damaging static voltages whenever you handle plastic or foam packing material or if you move components across plastic or carpets. Observe the following guidelines to minimize the potential for electrostatic discharge (ESD) damage, which can cause intermittent or complete component failures:

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- Always use an ESD grounding strap when you are handling components that are subject to ESD damage, and make sure that it is in direct contact with your skin.

  If a grounding strap is not available, hold the component in its antistatic bag (see Figure 76 on page 237) in one hand and touch the exposed, bare metal of the switch with the other hand immediately before inserting the component into the switch.

WARNING: For safety, periodically check the resistance value of the ESD strap. The measurement must be in the range of 1 through 10 Mohms.

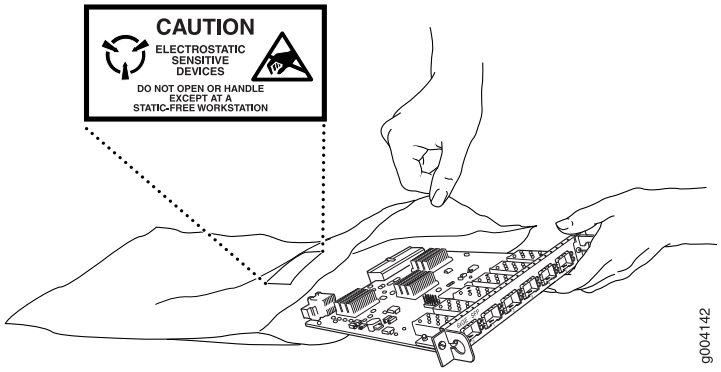
- When handling any component that is subject to ESD damage and that is removed from the chassis, make sure the equipment end of your ESD strap is attached to the ESD point on the chassis.

  If no grounding strap is available, touch the exposed, bare metal of the switch to ground yourself before handling the component.

- Avoid contact between the component that is subject to ESD damage and your clothing. ESD voltages emitted from clothing can damage components.

- When removing or installing a component that is subject to ESD damage, always place it component-side up on an antistatic surface, in an antistatic card rack, or in an antistatic bag (see Figure 76 on page 237). If you are returning a component, place it in an antistatic bag before packing it.

Figure 76: Place a Component into an Antistatic Bag



CAUTION: ANSI/TIA/EIA-568 cables such as category 5e and category 6 can get electrostatically charged. In order to dissipate this charge, always ground the cables to a suitable and safe earth ground before connecting them to the system.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- See Rear Panel of an EX2200 Switch for the ESD point location.
- See Rear Panel of an EX3200 Switch on page 8 for the ESD point location.
- See Rear Panel of an EX4200 Switch on page 11 for the ESD point location.
- See Front Panel of an EX4500 Switch for the ESD point location.

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- See Chassis Physical Specifications of an EX8208 Switch for the ESD point location.
- See Chassis Physical Specifications of an EX8216 Switch for the ESD point location.

AC Power Electrical Safety Guidelines for EX Series Switches

CAUTION: For switches with AC power supplies, an external surge protective device (SPD) must be used at the AC power source.

The following electrical safety guidelines apply to AC-powered switches:

- Note the following warnings printed on the chassis:

  "**CAUTION:** THIS UNIT HAS MORE THAN ONE POWER SUPPLY CORD. DISCONNECT ALL POWER SUPPLY CORDS BEFORE SERVICING TO AVOID ELECTRIC SHOCK."

  "**ATTENTION:** CET APPAREIL COMPORTE PLUS D'UN CORDON D'ALIMENTATION. AFIN DE PRÉVENIR LES CHOCS ÉLECTRIQUES, DÉBRANCHER TOUT CORDON D'ALIMENTATION AVANT DE FAIRE LE DÉPANNAGE."
- AC-powered switches are shipped with a three-wire electrical cord with a grounding-type plug that fits only a grounding-type power outlet. Do not circumvent this safety feature. Equipment grounding must comply with local and national electrical codes.
- You must provide an external certified circuit breaker rated minimum 20 A in the building installation.
- The power cord serves as the main disconnecting device for the switch. The socket outlet must be near the switch and be easily accessible.
- For EX Series switches that have more than one power supply connection, you must ensure that all power connections are fully disconnected so that power to the switch is completely removed to avoid electric shock. To disconnect power, unplug all power cords (one for each power supply).

Power Cable Warning (Japanese)

WARNING: The attached power cable is only for this product. Do not use the cable for another product.

注意

附属の電源コードセットはこの製品専用です。
他の電気機器には使用しないでください。

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235

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- Multiple Power Supplies Disconnection Warning for EX Series Switches on page 240
- Connecting AC Power to an EX2200 Switch
- Connecting AC Power to an EX3200 or EX4200 Switch on page 147
- Connecting AC Power to an EX4500 Switch
- Connecting AC Power to an EX8200 Switch

AC Power Disconnection Warning for EX Series Switches

WARNING: Before working on the switch or near power supplies, unplug all the power cords from an AC switch.

Waarschuwing Voordat u aan een frame of in de nabijheid van voedingen werkt, dient u bij wisselstroom toestellen de stekker van het netsnoer uit het stopcontact te halen.

Varoitus Kytke irti vaihtovirtalaitteiden virtajohto, ennen kuin teet mitään asennuspohjalle tai työskentelet virtalähteiden läheisyydessä.

Attention Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif.

Warnung Bevor Sie an einem Chassis oder in der Nähe von Netzgeräten arbeiten, ziehen Sie bei Wechselstromeinheiten das Netzkabel ab bzw.

Avvertenza Prima di lavorare su un telaio o intorno ad alimentatori, scollegare il cavo di alimentazione sulle unità CA.

Advarsel Før det utføres arbeid på kabinettet eller det arbeides i nærheten av strømforsyningsenheter, skal strømledningen trekkes ut på vekselstrømsenheter.

Aviso Antes de trabalhar num chassis, ou antes de trabalhar perto de unidades de fornecimento de energia, desligue o cabo de alimentação nas unidades de corrente alternada.

¡Atención! Antes de manipular el chasis de un equipo o trabajar cerca de una fuente de alimentación, desenchufar el cable de alimentación en los equipos de corriente alterna (CA).

Varning! Innan du arbetar med ett chassi eller nära strömförsörjningsenheter skall du för växelströmsenheter dra ur nätsladden.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- AC Power Electrical Safety Guidelines for EX Series Switches on page 238

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Multiple Power Supplies Disconnection Warning for EX Series Switches

WARNING: For EX Series switches that have more than one power supply connection, you must ensure that all power connections are fully disconnected so that power to the switch is completely removed.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- AC Power Electrical Safety Guidelines for EX Series Switches on page 238
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240

Power Sources for Redundant Power Supplies Warning for EX4200 Switches

EX4200 switches have a redundant power supply. When you have redundant power supplies in a switch, you must connect each power supply to a different input power source. Failure to do so makes the switch susceptible to total power failure if one of the power supplies fails.

冗余电源

如果 Juniper Networks 设备包含一个可选的冗余电源　请将两个电源连接到不同的输入电源。不这样做的结果是 Juniper Networks 设备一路供电出问题时导致全部的电源故障

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- AC Power Electrical Safety Guidelines for EX Series Switches on page 238

DC Power Electrical Safety Guidelines for EX Series Switches

The following electrical safety guidelines apply to a DC-powered switch:

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- A DC-powered switch is equipped with a DC terminal block that is rated for the power requirements of a maximally configured switch.

NOTE: To supply sufficient power, terminate the DC input wiring on a facility DC source capable of supplying at least 8 A at –48 VDC for EX3200 and EX4200 switches.

To supply sufficient power, terminate the DC input wiring on a facility DC source capable of supplying at least 60 A at –48 VDC for EX8208 switches.

To supply sufficient power, terminate the DC input wiring on a facility DC source capable of supplying at least 100 A at –48 VDC for EX8216 switches.

Incorporate an easily accessible disconnect device into the facility wiring. Be sure to connect the ground wire or conduit to a solid office earth ground. A closed loop ring is recommended for terminating the ground conductor at the ground stud.

- Run two wires from the circuit breaker box to a source of 48 VDC.
- A DC-powered router that is equipped with a DC terminal block is intended only for installation in a restricted access location. In the United States, a restricted access area is one in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code ANSI/NFPA 70.

NOTE: Primary overcurrent protection is provided by the building circuit breaker. This breaker must protect against excess currents, short circuits, and earth grounding faults in accordance with NEC ANSI/NFPA 70.

- Ensure that the polarity of the DC input wiring is correct. Under certain conditions, connections with reversed polarity might trip the primary circuit breaker or damage the equipment.
- For personal safety, connect the green and yellow wire to safety (earth) ground at both the switch and the supply side of the DC wiring.
- The marked input voltage of –48 VDC for a DC-powered switch is the nominal voltage associated with the battery circuit, and any higher voltages are only to be associated with float voltages for the charging function.
- Because the switch is a positive ground system, you must connect the positive lead to the terminal labeled RTN, the negative lead to the terminal labeled –48 VDC, and the earth ground to the chassis grounding points.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- DC Power Disconnection Warning for EX Series Switches on page 242
- DC Power Grounding Requirements and Warning for EX Series Switches on page 243
- DC Power Wiring Sequence Warning for EX Series Switches on page 244
- DC Power Wiring Terminations Warning for EX Series Switches on page 246

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- Connecting DC Power to an EX3200 or EX4200 Switch on page 149
- Connecting DC Power to an EX8200 Switch

DC Power Disconnection Warning for EX Series Switches

WARNING: Before performing any of the DC power procedures, ensure that power is removed from the DC circuit. To ensure that all power is off, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

Waarschuwing Voordat u een van de onderstaande procedures uitvoert, dient u te controleren of de stroom naar het gelijkstroom circuit uitgeschakeld is. Om u ervan te verzekeren dat alle stroom UIT is geschakeld, kiest u op het schakelbord de stroomverbreker die het gelijkstroom circuit bedient, draait de stroomverbreker naar de UIT positie en plakt de schakelaarhendel van de stroomverbreker met plakband in de UIT positie vast.

Varoitus Varmista, että tasavirtapiirissä ei ole virtaa ennen seuraavien toimenpiteiden suorittamista. Varmistaaksesi, että virta on KATKAISTU täysin, paikanna tasavirrasta huolehtivassa kojetaulussa sijaitseva suojakytkin, käännä suojakytkin KATKAISTU-asentoon ja teippaa suojakytkimen varsi niin, että se pysyy KATKAISTU-asennossa.

Attention Avant de pratiquer l'une quelconque des procédures ci-dessous, vérifier que le circuit en courant continu n'est plus sous tension. Pour en être sûr, localiser le disjoncteur situé sur le panneau de service du circuit en courant continu, placer le disjoncteur en position fermée (OFF) et, à l'aide d'un ruban adhésif, bloquer la poignée du disjoncteur en position OFF.

Warnung Vor Ausführung der folgenden Vorgänge ist sicherzustellen, daß die Gleichstromschaltung keinen Strom erhält. Um sicherzustellen, daß sämtlicher Strom abgestellt ist, machen Sie auf der Schalttafel den Unterbrecher für die Gleichstromschaltung ausfindig, stellen Sie den Unterbrecher auf AUS, und kleben Sie den Schaltergriff des Unterbrechers mit Klebeband in der AUS-Stellung fest.

Avvertenza Prima di svolgere una qualsiasi delle procedure seguenti, verificare che il circuito CC non sia alimentato. Per verificare che tutta l'alimentazione sia scollegata (OFF), individuare l'interruttore automatico sul quadro strumenti che alimenta il circuito CC, mettere l'interruttore in posizione OFF e fissarlo con nastro adesivo in tale posizione.

Advarsel Før noen av disse prosedyrene utføres, kontroller at strømmen er frakoblet likestrømkretsen. Sørg for at all strøm er slått AV. Dette gjøres ved å lokalisere strømbryteren på brytertavlen som betjener likestrømkretsen, slå strømbryteren AV og teipe bryterhåndtaket på strømbryteren i AV-stilling.

Aviso Antes de executar um dos seguintes procedimentos, certifique-se que desligou a fonte de alimentação de energia do circuito de corrente contínua. Para se assegurar que toda a corrente foi DESLIGADA, localize o disjuntor no painel que serve o circuito

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de corrente contínua e coloque-o na posição OFF (Desligado), segurando nessa posição a manivela do interruptor do disjuntor com fita isoladora.

¡Atención! Antes de proceder con los siguientes pasos, comprobar que la alimentación del circuito de corriente continua (CC) esté cortada (OFF). Para asegurarse de que toda la alimentación esté cortada (OFF), localizar el interruptor automático en el panel que alimenta al circuito de corriente continua, cambiar el interruptor automático a la posición de Apagado (OFF), y sujetar con cinta la palanca del interruptor automático en posición de Apagado (OFF).

Varning! Innan du utför någon av följande procedurer måste du kontrollera att strömförsörjningen till likströmskretsen är bruten. Kontrollera att all strömförsörjning är BRUTEN genom att slå AV det överspänningsskydd som skyddar likströmskretsen och tejpa fast överspänningsskyddets omkopplare i FRÅN-läget.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240
- DC Power Grounding Requirements and Warning for EX Series Switches on page 243
- DC Power Wiring Sequence Warning for EX Series Switches on page 244
- DC Power Wiring Terminations Warning for EX Series Switches on page 246

DC Power Grounding Requirements and Warning for EX Series Switches

An insulated grounding conductor that is identical in size to the grounded and ungrounded branch circuit supply conductors but is identifiable by green and yellow stripes is installed as part of the branch circuit that supplies the unit. The grounding conductor is a separately derived system at the supply transformer or motor generator set.

WARNING: When you install the switch, the ground connection must always be made first and disconnected last.

Waarschuwing Bij de installatie van het toestel moet de aardverbinding altijd het eerste worden gemaakt en het laatste worden losgemaakt.

Varoitus Laitetta asennettaessa on maahan yhdistäminen aina tehtävä ensiksi ja maadoituksen irti kytkeminen viimeiseksi.

Attention Lors de l'installation de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier.

Warnung Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.

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Avvertenza In fase di installazione dell'unità, eseguire sempre per primo il collegamento a massa e disconnetterlo per ultimo.

Advarsel Når enheten installeres, må jordledningen alltid tilkobles først og frakobles sist.

Aviso Ao instalar a unidade, a ligação à terra deverá ser sempre a primeira a ser ligada, e a última a ser desligada.

¡Atención! Al instalar el equipo, conectar la tierra la primera y desconectarla la última.

Varning! Vid installation av enheten måste jordledningen alltid anslutas först och kopplas bort sist.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240
- DC Power Disconnection Warning for EX Series Switches on page 242
- DC Power Wiring Sequence Warning for EX Series Switches on page 244
- DC Power Wiring Terminations Warning for EX Series Switches on page 246

DC Power Wiring Sequence Warning for EX Series Switches

WARNING: Wire the DC power supply using the appropriate lugs. When connecting power, the proper wiring sequence is ground to ground, +RTN to +RTN, then –48 V to –48 V. When disconnecting power, the proper wiring sequence is –48 V to –48 V, +RTN to +RTN, then ground to ground. Note that the ground wire must always be connected first and disconnected last.

Waarschuwing De juiste bedradingsvolgorde verbonden is aarde naar aarde, +RTN naar +RTN, en –48 V naar – 48 V. De juiste bedradingsvolgorde losgemaakt is en –48 naar –48 V, +RTN naar +RTN, aarde naar aarde.

Varoitus Oikea yhdistettava kytkentajarjestys on maajohto maajohtoon, +RTN varten +RTN, –48 V varten – 48 V. Oikea irrotettava kytkentajarjestys on –48 V varten – 48 V, +RTN varten +RTN, maajohto maajohtoon.

Attention Câblez l'approvisionnement d'alimentation CC En utilisant les crochets appropriés à l'extrémité de câblage. En reliant la puissance, l'ordre approprié de câblage est rectifié pour rectifier, +RTN à +RTN, puis –48 V à –48 V. En débranchant la puissance, l'ordre approprié de câblage est –48 V à –48 V, +RTN à +RTN, a alors rectifié pour rectifier. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois. Notez que le fil de masse devrait toujours être relié d'abord et débranché pour la dernière fois.

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Warnung Die Stromzufuhr ist nur mit geeigneten Ringösen an das DC Netzteil anzuschliessen. Die richtige Anschlusssequenz ist: Erdanschluss zu Erdanschluss, +RTN zu +RTN und dann -48V zu -48V. Die richtige Sequenz zum Abtrennen der Stromversorgung ist -48V zu -48V, +RTN zu +RTN und dann Erdanschluss zu Erdanschluss. Es ist zu beachten dass der Erdanschluss immer zuerst angeschlossen und als letztes abgetrennt wird.

Avvertenza Mostra la morsettiera dell alimentatore CC. Cablare l'alimentatore CC usando i connettori adatti all'estremità del cablaggio, come illustrato. La corretta sequenza di cablaggio è da massa a massa, da positivo a positivo (da linea ad L) e da negativo a negativo (da neutro a N). Tenere presente che il filo di massa deve sempre venire collegato per primo e scollegato per ultimo.

Advarsel Riktig tilkoples tilkoplingssekvens er jord til jord, +RTN til +RTN, –48 V til – 48 V. Riktig frakoples tilkoplingssekvens er –48 V til – 48 V, +RTN til +RTN, jord til jord.

Aviso Ate con alambre la fuente de potencia cc Usando los terminales apropiados en el extremo del cableado. Al conectar potencia, la secuencia apropiada del cableado se muele para moler, +RTN a +RTN, entonces –48 V a –48 V. Al desconectar potencia, la secuencia apropiada del cableado es –48 V a –48 V, +RTN a +RTN, entonces molió para moler. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último. Observe que el alambre de tierra se debe conectar siempre primero y desconectar por último.

¡Atención! Wire a fonte de alimentação de DC Usando os talões apropriados na extremidade da fiação. Ao conectar a potência, a seqüência apropriada da fiação é moída para moer, +RTN a +RTN, então –48 V a –48 V. Ao desconectar a potência, a seqüência apropriada da fiação é –48 V a –48 V, +RTN a +RTN, moeu então para moer. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último. Anote que o fio à terra deve sempre ser conectado primeiramente e desconectado por último.

Varning! Korrekt kopplingssekvens ar jord till jord, +RTN till +RTN, –48 V till –48 V. Korrekt kopplas kopplingssekvens ar –48 V till –48 V, +RTN till +RTN, jord till jord.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240
- DC Power Disconnection Warning for EX Series Switches on page 242
- DC Power Grounding Requirements and Warning for EX Series Switches on page 243
- DC Power Wiring Terminations Warning for EX Series Switches on page 246

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DC Power Wiring Terminations Warning for EX Series Switches

WARNING: When stranded wiring is required, use approved wiring terminations, such as closed-loop or spade-type with upturned lugs. These terminations must be the appropriate size for the wires and must clamp both the insulation and conductor.

Waarschuwing Wanneer geslagen bedrading vereist is, dient u bedrading te gebruiken die voorzien is van goedgekeurde aansluitingspunten, zoals het gesloten-lus type of het grijperschop type waarbij de aansluitpunten omhoog wijzen. Deze aansluitpunten dienen de juiste maat voor de draden te hebben en dienen zowel de isolatie als de geleider vast te klemmen.

Varoitus Jos säikeellinen johdin on tarpeen, käytä hyväksyttyä johdinliitäntää, esimerkiksi suljettua silmukkaa tai kourumaista liitäntää, jossa on ylöspäin käännetyt kiinnityskorvat. Tällaisten liitäntöjen tulee olla kooltaan johtimiin sopivia ja niiden tulee puristaa yhteen sekä eristeen että johdinosan.

Attention Quand des fils torsadés sont nécessaires, utiliser des douilles terminales homologuées telles que celles à circuit fermé ou du type à plage ouverte avec cosses rebroussées. Ces douilles terminales doivent être de la taille qui convient aux fils et doivent être refermées sur la gaine isolante et sur le conducteur.

Warnung Wenn Litzenverdrahtung erforderlich ist, sind zugelassene Verdrahtungsabschlüsse, z.B. für einen geschlossenen Regelkreis oder gabelförmig, mit nach oben gerichteten Kabelschuhen zu verwenden. Diese Abschlüsse sollten die angemessene Größe für die Drähte haben und sowohl die Isolierung als auch den Leiter festklemmen.

Avvertenza Quando occorre usare trecce, usare connettori omologati, come quelli a occhiello o a forcella con linguette rivolte verso l'alto. I connettori devono avere la misura adatta per il cablaggio e devono serrare sia l'isolante che il conduttore.

Advarsel Hvis det er nødvendig med flertrådede ledninger, brukes godkjente ledningsavslutninger, som for eksempel lukket sløyfe eller spadetype med oppoverbøyde kabelsko. Disse avslutningene skal ha riktig størrelse i forhold til ledningene, og skal klemme sammen både isolasjonen og lederen.

Aviso Quando forem requeridas montagens de instalação eléctrica de cabo torcido, use terminações de cabo aprovadas, tais como, terminações de cabo em circuito fechado e planas com terminais de orelha voltados para cima. Estas terminações de cabo deverão ser do tamanho apropriado para os respectivos cabos, e deverão prender simultaneamente o isolamento e o fio condutor.

¡Atención! Cuando se necesite hilo trenzado, utilizar terminales para cables homologados, tales como las de tipo "bucle cerrado" o "espada", con las lengüetas de conexión vueltas hacia arriba. Estos terminales deberán ser del tamaño apropiado para los cables que se utilicen, y tendrán que sujetar tanto el aislante como el conductor.

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Varning! När flertrådiga ledningar krävs måste godkända ledningskontakter användas, t.ex. kabelsko av sluten eller öppen typ med uppåtvänd tapp. Storleken på dessa kontakter måste vara avpassad till ledningarna och måste kunna hålla både isoleringen och ledaren fastklämda.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240
- DC Power Disconnection Warning for EX Series Switches on page 242
- DC Power Grounding Requirements and Warning for EX Series Switches on page 243
- DC Power Wiring Sequence Warning for EX Series Switches on page 244

TN Power Warning for EX Series Switches

WARNING: The switch is designed to work with a TN power system.

Waarschuwing Het apparaat is ontworpen om te functioneren met TN energiesystemen.

Varoitus Koje on suunniteltu toimimaan TN-sähkövoimajärjestelmien yhteydessä.

Attention Ce dispositif a été conçu pour fonctionner avec des systèmes d'alimentation TN.

Warnung Das Gerät ist für die Verwendung mit TN-Stromsystemen ausgelegt.

Avvertenza Il dispositivo è stato progettato per l'uso con sistemi di alimentazione TN.

Advarsel Utstyret er utfomet til bruk med TN-strømsystemer.

Aviso O dispositivo foi criado para operar com sistemas de corrente TN.

¡Atención! El equipo está diseñado para trabajar con sistemas de alimentación tipo TN.

Varning! Enheten är konstruerad för användning tillsammans med elkraftssystem av TN-typ.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- Grounded Equipment Warning for EX Series Switches on page 226
- Multiple Power Supplies Disconnection Warning for EX Series Switches on page 240

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In Case of Electrical Accident: Action to Take on an EX Series Switch

If an electrical accident results in an injury, take the following actions in this order:

1. Use caution. Be aware of potentially hazardous conditions that could cause further injury.
2. Disconnect power from the switch.
3. If possible, send another person to get medical aid. Otherwise, assess the condition of the victim, then call for help.

Related Topics

- General Safety Guidelines and Warnings for EX Series Switches on page 207
- General Electrical Safety Guidelines and Warnings for EX Series Switches on page 235
- AC Power Electrical Safety Guidelines for EX Series Switches on page 238
- DC Power Electrical Safety Guidelines for EX Series Switches on page 240

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PART 9

Compliance Information

- Compliance Information on page 251

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CHAPTER 21

Compliance Information

- Agency Approvals for EX Series Switches on page 251
- Compliance Statements for EMC Requirements for EX Series Switches on page 252
- Compliance Statements for Acoustic Noise for EX Series Switches on page 254
- Declaration of Conformity for EX3200 and EX4200 Switches on page 255

Agency Approvals for EX Series Switches

EX Series switches comply with the following standards:

- Safety
  - CAN/CSA-22.2 No. 60950–1–03/UL 60950–1. Safety of Information Technology Equipment
  - EN 60950–1:2001. Safety of Information Technology Equipment
  - EN 60825–1 Safety of Laser Products – Part 1: Equipment Classification, Requirements and User's Guide
- EMC
  - FCC 47CFR Part 15 Class A (USA)
  - EN 55022 Class A Emissions (Europe)
  - ICES-003 Class A
  - VCCI Class A (Japan)
  - AS/NZS CISPR 22 Class A (Australia/New Zealand)
  - CISPR 22 Class A
  - EN 55024
  - EN 300386
  - EN 61000-3-2 Power Line Harmonics
  - EN 61000-3-3 Voltage Fluctuations and Flicker

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- EN 61000-4-2 ESD
- EN 61000-4-3 Radiated Immunity
- EN 61000-4-4 EFT
- EN 61000-4-5 Surge
- EN 61000-4-6 Low Frequency Common Immunity
- EN 61000-4-11 Voltage Dips and Sags

Related Topics

- Compliance Statements for EMC Requirements for EX Series Switches on page 252
- Compliance Statements for Acoustic Noise for EX Series Switches on page 254

Compliance Statements for EMC Requirements for EX Series Switches

This topic describes the EMC requirements for EX Series switches for:

- Canada on page 252
- European Community on page 253
- Japan on page 253
- United States on page 253
- FCC Part 15 Statement on page 253
- Non-Regulatory Environmental Standards on page 254

Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. Industry Canada does not guarantee the equipment will operate to the users' satisfaction.

Before installing this equipment, users should ensure that it is permissible to connect the equipment to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the inside wiring associated with a single line individual service may be extended by means of a certified connector assembly. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

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CAUTION: Users should not attempt to make electrical ground connections by themselves, but should contact the appropriate inspection authority or an electrician, as appropriate.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

European Community

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Japan

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

The preceding translates as follows:

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

VCCI-A

United States

The EX Series switch has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Part 15 Statement

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

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If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for help.

Non-Regulatory Environmental Standards

NEBS compliance—These EX Series switch models are Network Equipment Building System (NEBS) compliant:

- EX2200-24T and EX2200-48T
- EX3200-24T, EX3200-48T, EX4200-24F, EX4200-24T, and EX4200-48T
- All EX8200 models

Those switch models meet the following NEBS compliance standards:

- SR-3580 NEBS Criteria Levels (Level 3 Compliance)
- GR-1089-CORE: EMC and Electrical Safety for Network Telecommunications Equipment
- GR-63-CORE: NEBS, Physical Protection
  - The equipment is suitable for installation as part of the Common Bonding Network (CBN).
  - The equipment is suitable for installation in locations where the National Electrical Code (NEC) applies.
  - The battery return connection is to be treated as an Isolated DC return (DC-I), as defined in GR-1089-CORE.

Related Topics
- Agency Approvals for EX Series Switches on page 251
- Compliance Statements for Acoustic Noise for EX Series Switches on page 254

Compliance Statements for Acoustic Noise for EX Series Switches

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 70 dB(A) oder weniger gemäss EN ISO 7779

Translation:

The emitted sound pressure is below 70 dB(A) per EN ISO 7779.

Related Topics
- Agency Approvals for EX Series Switches on page 251

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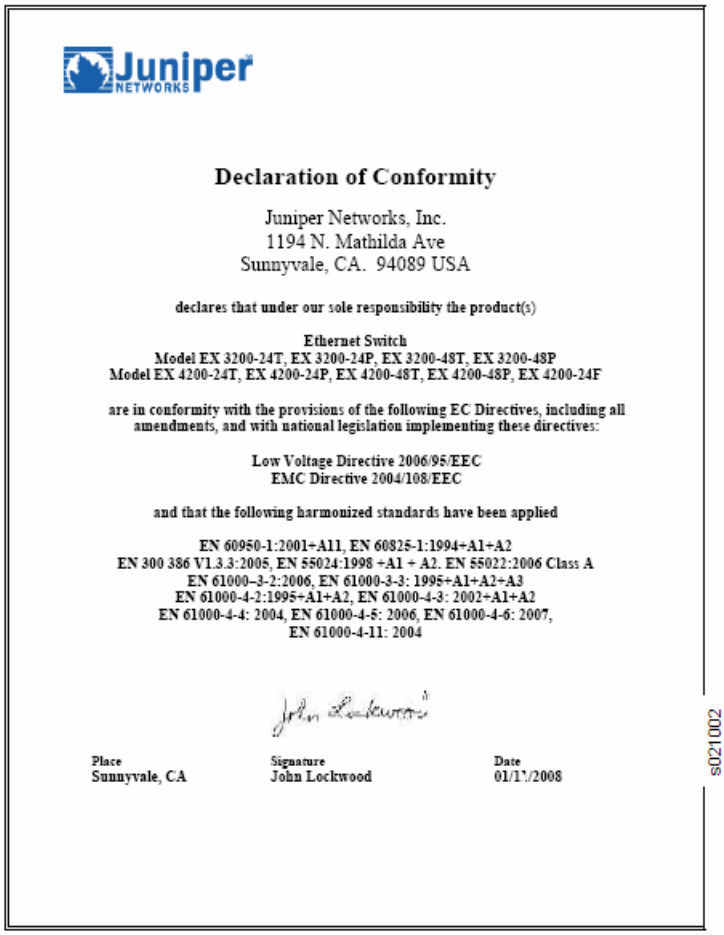
- Compliance Statements for EMC Requirements for EX Series Switches on page 252

Declaration of Conformity for EX3200 and EX4200 Switches



Juniper NETWORKS

Declaration of Conformity

Juniper Networks, Inc.
1194 N. Mathilda Ave
Sunnyvale, CA. 94089 USA

declares that under our sole responsibility the product(s)

Ethernet Switch
Model EX 3200-24T, EX 3200-24P, EX 3200-48T, EX 3200-48P
Model EX 4200-24T, EX 4200-24P, EX 4200-48T, EX 4200-48P, EX 4200-24F

are in conformity with the provisions of the following EC Directives, including all amendments, and with national legislation implementing these directives:

Low Voltage Directive 2006/95/EEC
EMC Directive 2004/108/EEC

and that the following harmonized standards have been applied

EN 60950-1:2001+A11, EN 60825-1:1994+A1+A2
EN 300 386 V1.3.3:2005, EN 55024:1998 +A1 + A2. EN 55022:2006 Class A
EN 61000–3-2:2006, EN 61000-3-3: 1995+A1+A2+A3
EN 61000-4-2:1995+A1+A2, EN 61000-4-3: 2002+A1+A2
EN 61000-4-4: 2004, EN 61000-4-5: 2006, EN 61000-4-6: 2007,
EN 61000-4-11: 2004

Place: Sunnyvale, CA
Signature: John Lockwood
Date: 01/17/2008

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Related Topics

- Agency Approvals for EX Series Switches on page 251
- Compliance Statements for EMC Requirements for EX Series Switches on page 252
- Compliance Statements for Acoustic Noise for EX Series Switches on page 254

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